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VOLKMAN'S ISCHAEMIC CONTRACTURE.*

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In 1925, I read a paper before the Southern Medical Society entitled "Peripheral Nerve Injury Associated with Fracture of the Long Bones." At that time, the view was expressed that when evidence of definite nerve injury following trauma, whether accompanied by fracture or not, persisted for longer than six weeks, the nerve should be explored. This conclusion was based on our experience in thirty-one cases operated upon which clearly showed: First, that the results obtained by operations upon injured nerves were in direct proportion to the shortness of time elapsed between the onset of the nerve injury and operation; second, that after the lapse of a year and a half or two years, little could be expected in the way of nerve regeneration following operation. Since that time we have seen no reason to change this opinion but rather we have become more convinced that it is correct. It is my intention in this presentation to discuss a particular type of nerve injury associated with fracture—namely, Volkman's ischaemic contracture, from this point of view.

Since Volkman in 1875 first described the particular form of contracture involving the wrist and fingers which bears his name, a fairly voluminous literature has appeared. This has dealt chiefly with etiology and pathology; comparatively little has been suggested as to treatment, at least of an encouraging character so far as return of useful function is involved. Most methods of treatment are based upon the correction of deformity and rely upon such correction to restore usefulness to the impaired extremity. Our experience with Volkman's ischaemic contracture during the past seven years leads us to believe that in many cases something more than correction of deformity is necessary in the way of treatment if the best outcome is to be obtained, and it is this feature of the management of this condition that will be emphasized in what is to follow:

Volkman's ischaemic contracture results from severe injury to the arm, forearm or elbow, usually a supracondylar fracture of the humerus. It occurs most commonly in children between the ages of six and fourteen years and is rarely encountered in adults. Schultze and Eitel[1] believe that the explanation of its frequent occurrence in children is to be found in the fact that the blood supply to the muscles in children is much less per volume than in adults and that consequently interference with the blood supply to muscles in children causes much more damage than in adults. The actual causative factor which is responsible for the condition is compression of the blood vessels and nerves at the elbow or below, interfering with the circulation on one hand and nerve conductivity on the other.

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The compression which causes the damage is generally admitted to be due to the hemorrhage and inflammatory exudate poured out and retained within the deep fascia. The swelling produced, because of the unyielding character of the fascial envelope, causes tremendous pressure upon the intrafascial structures which suffer damage in proportion to the pressure produced and their vulnerability to this pressure. The blood vessels and nerves are the most vulnerable and so suffer the greatest damage. The part played by tight bandaging in causing pressure upon the vessels and nerves has been much discussed, and while it unquestionably is, from time to time, a factor; in by far the majority of cases it is of much less importance than is generally supposed. The use of the acutely flexed position of the elbow in treating supracondylar fractures of the humerus has been blamed also, but here again it is in only the isolated case that this position can be held responsible. Both tight bandaging and acute flexion of the elbow can and do add to the pressure on the vessels and nerves caused by the swelling within the deep fascia, but in the opinion of most observers the latter is by far the most important, and in the majority of cases, the only damaging agent. This fact is of considerable importance since often unjust criticism has been directed toward a medical attendant because of the widely held view that either tight bandaging or the position in which the elbow was treated is the cause of the contracture. Unfortunately, there is no way in which the amount of compression present within the deep fascia in a given case can be estimated, so it is impossible in most cases to guard against the onset of symptoms except by careful and frequent inspection.

PATHOLOGY.

The pathological changes found in Volkman's ischaemic contracture are very definite and involve the flexor muscles of the forearm and the trunks of the median and ulnar nerves, particular the median.

The pathological changes in the flexor muscles are a more or less widespread necrosis of the muscle fibers and their replacement by dense connective tissue so that the bodies of the muscles contain few contractile fibers, are pale in color, hard and firm in texture and are bound together into a single mass by adhesions. Such changes in the flexor muscles are caused by interference with their blood supply due to compression of the blood vessels. Whether interference with the arterial supply or venous return is responsible for the damage is still a subject of debate. We know that interference with the arterial supply to muscles results in necrosis if the interference lasts for several hours, and necrosis has been demonstrated (Schulze and Eitel) in at least one case of ischaemic contracture examined early and by animal experiments. On the other hand, Brooks has shown that interference with the venous return causes hemorrhage, edema, fibrosis and contractures in muscles, changes which are very characteristic of Volkman's contracture. Cases have been reported in which ischaemic contracture has occurred without any disappearance of the radical pulse which indicates that in these cases at least the arterial circulation was intact. Certainly, the thin walled veins are much less resistant to compression than the thicker walled arteries and should suffer more damage. On the whole, then, the preponderance of evidence seems to point toward venous congestion as the most probable cause of the muscle degeneration present in Volkman's contracture.

The changes found in the nerve trunks are those characteristic of compression. The nerve is small in caliber and hard and firm in consistency; the sheath is thickened and adherent and the fibrilae within the nerve are found surrounded by dense connective tissue. In the cases operated upon the nerve trunks have been found embedded in firm scar tissue which is very difficult to remove. The median nerve in our experience has been the most seriously

involved. This may be due to the fact that the arrangement of the fascial planes about the elbow tend to direct the flow of hemorrhage and exudate toward the ulnar side of the elbow and about the median nerve. The ulnar nerve is at times involved and in two cases operated upon all the nerves, median, ulnar and musculospiral were found completely destroyed. The result of such damage to nerves is interference with their conductivity, the consequence of which is trophic, sensory, motor disturbances and deformity in the forearm and hand.

Extensive investigation and experimental studies have shown that both muscle degeneration and nerve injury are found in Volkman's ischaemic contracture. The consensus of opinion today is that the muscle injury is the more important factor and that the nerve damage is of secondary importance. In certain cases this seems to be unquestionably true but we believe it is not so in all cases. A careful study of Volkman's ischaemic contracture in our clinic has led us to separate our cases into two types. The first type includes these in which there is the usual contracture with loss of function in the forearm, hand and fingers, but with only moderate damage to the flexor muscles as evidenced by examination (Fig. I); the second type is that in

Fig. I. Type one—Volkman's ischaemic paralysis, with only moderate muscle destruction as evidenced by the fullness of the forearm.

which is there is profound damage to the flexor muscles which are reduced to a hard, fibrous, atrophied mass (Fig. II). In the

Fig. II. Type two—Volkman's ischaemic paralysis, with marked muscle destruction as indicated by the extreme atrophy of the flexor mucles.

first type we feel that the damage to a nerve or nerves is the primary pathology and that the muscle injury is of secondary importance. In the second type, we believe that whatever the nerve damage has been, that involving the muscles is as great or greater, and that it therefore is the most outstanding factor in causing deformity and interference with function. We have then attempted to classify our cases into these two types: those in which the nerve injury predominates and those in which the muscle damage is the outstanding feature. We believe that this classification has been of material aid in enabling us to formulate a prognosis and outline our treatment. In the first type we feel that the prognosis is good if proper treatment is instituted immediately. In the second type the prognosis is bad so far as return of useful function is to be expected because of the extreme destruction of muscle tissue.

SYMPTOMS.

It seems scarcely necessary to discuss the symptomatology of this condition since the well-developed case is so classical in its manifestations and so familiar to all of you. It is perhaps worth while to briefly review the symptoms which are seen early. In cases which we have investigated the early symptoms seem to appear in fairly definite sequence. First is excessive swelling of the hand and fingers which rapidly become cyanotic. Almost coincident with this is the complaint of excessive pain which persists in its intensity long after the patient should begin to be comfortable. Within twenty-four to forty-eight hours, a flexion

contraction appears in the fingers and thumb, not the easily correctable contractures which often occur, but resistant contractures which are difficult to overcome any attempts to correct which cause intense pain. Numbness, tingling or hyperaesthesia are complained of at about the same time in the fingers. Finally, within a few days trophic ulcers appear in the anticubital fossa or about the wrist. The early appearance of hyperaesthesia in the fingers and the early occurrence of trophic ulcers speak strongly for interference with nerve conductivity. In some cases disappearance of the radial pulse is noted. The presence of all or any of these symptoms is extremely significant, and demand that immediate steps be taken to relieve compression. Probably in no traumatic condition is it as necessary to be constantly on the lookout for both circulatory and nerve interference, as in injuries about the elbow in children, for failure to observe the onset of ischaemia means disaster for the patient and criticism of the medical attendant.

TREATMENT.

In combating this condition it is evident that prevention is the ideal treatment. In a certain percentage of cases this is possible if a diagnosis is made early enough and all bandages are removed and the extremity placed in a position which relieves or decreases pressure. Unfortunately, however, in the majority of cases, such measures do not relieve the pressure within the fascia which is causing most of the damage. It has been suggested that in such cases the pressure be relieved by making incisions through the fascia for the purpose of securing drainage, and it seems to be a very logical procedure. This has been done in a few cases with apparently happy results; we have had no personal experience, but would not hesitate to resort to it in case of necessity.

Once the contracture is established, treatment can only be directed toward securing what improvement is possible; rarely is a complete recovery made. It is in this stage that we feel the division of cases into the two types described is useful in enabling us to determine the form of treatment which will insure the best outcome.

Today I wish to direct your attention particularly to what we have designated as the first type of Volkman's ischaemic contracture. In this type, there is damage to both nerves and muscles, but the muscle damage has resulted in only moderate destruction of the flexor muscles so that we have left a useful amount of contractile tissue. We believe under these conditions that the nerve supply to whatever muscle tissue is left intact becomes of paramount importance if we are to get the most from it in function and that every effort should be made to restore nerve conductivity so far as possible. In this type of Volkman's contracture we do an immediate exploration of the nerves about the elbow for the purpose of determining the amount of nerve

Fig. III. Diagramatic picture of injury to the median nerve in Volkman's ischaemis paralysis—actual case at operation.

injury present and correcting it if possible. As a rule, we find the median nerve severely damaged (Fig. III); the ulnar nerve at times involved and occasionally the musculospiral. In one case the median nerve was hooked over the distal end of the proximal fragment, but usually it is found embedded in and compressed by a mass of dense scar tissue, apparently organized blood clot and inflammatory exudate. In no case have we encountered complete severance of any of the nerves at the elbow.

The procedure carried out on the nerve or nerves has been in all cases a careful neurolysis and transplantation of the nerve into a new bed where it is surrounded by normal muscle tissue. In doing the neurolysis, the thickened sheath is dissected off and the fibrilae separated by dissecting out the scar tissue lying between them so that at the end of the operation the nerve is soft and compressible instead of being a hard dense and almost cartilage-like cord. The greatest care should be taken to see that there are no bands of scar tissue left which may later contract and cause pressure and that all hemorrhage is controlled and the wound dry. We feel that this procedure relieves a definite pathological condition and ensures the damaged muscles of the best nerve supply which can be given them.

No attempt at correction of deformity is made before operation. At the time of operation a cast is applied in the best position which can be secured, the amount of correction which is obtainable immediately after neurolysis is at times astonishing and inexplainable. The cast is wedged starting within a week or ten days of the operation and the wedging continued until overcorrection of the flexion is secured, the cast being changed as often as is necessary (Fig. IV). When the deformity has been corrected, a cockup splint is applied and physiotherapy given and continued as long as is necessary.

In our experience neurolysis has proven most satisfactory, and we are convinced

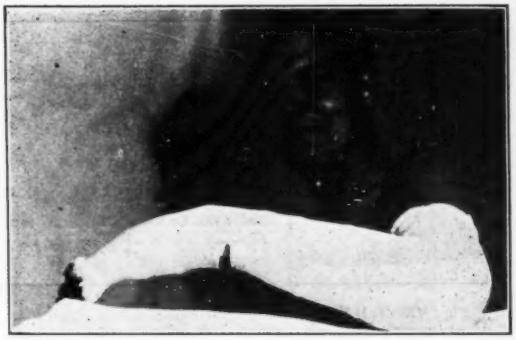

Fig. IV. A wedged cast to secure gradual correction of flexion deformity.

that if used in properly selected cases, it will result in the return of an amount of function which cannot be obtained by any other form of treatment (Fig. V). It should be emphasized, however, that time is a very important factor if the neurolysis is within six months a very excellent outcome may be expected; cases operated upon a year after injury do not do nearly so well, while those operated upon a year and a half or two years after injury rarely regain any useful amount of function.

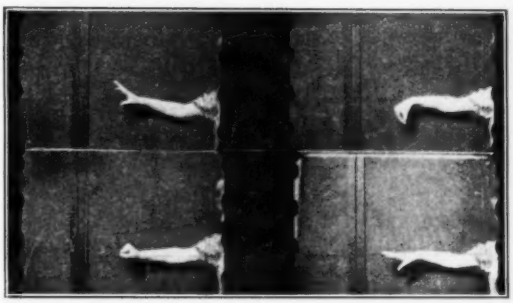

Fig. V. Result after neurolysis of the median nerve—six months after injury.

In cases falling in type two, where there has been so much muscle destruction that practically no contractile tissue is left, little or nothing can be expected of nerve operations. We are accustomed, however, to do a neurolysis if there is even trace of muscle present, but as a "forlorn hope" than with the expectation of much result, although in a few cases there seems to have been some definite benefit.

Fig. VI. (a) Hand before stretching.

In type two cases, unquestionably the best results are to be obtained from gradual stretching of the contracted fingers and wrist according to the method of Sir Robert Jones, which often gives an astonishing amount of use, and at least overcomes the extreme deformity (Fig. VI). Shortening of the bones of the forearm has been done frequently and is a useful procedure in some cases. We have used it but once with quite a satisfactory improvement. Tendon lengthening has not been satisfactory and we have practically abandoned it.

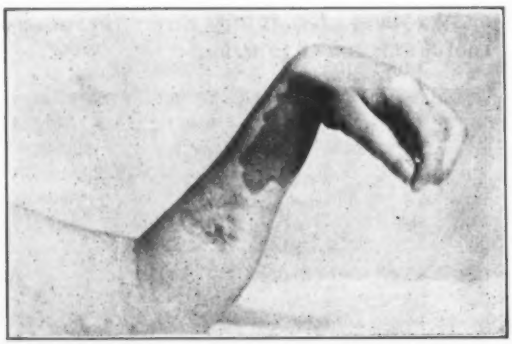

Fig. VI. (b) Partly stretched by a wedged cast.

We have operated upon 16 cases in the past seven years. In these cases the median nerve was involved 10 times; the median and ulnar were involved 4 times, and all three nerves twice.

The results were excellent in 9 cases, all of which were operated upon within 8 months of the injury. Fair results were secured in 5 cases; these were operated upon from one to two years after injury. In 2 cases no result so far as return of function was secured; these were both of the second type with extensive damage to both the flexor muscles and the nerves.

In Volkman's ischaemic contracture we have a condition which causes severe deformity and complete or almost complete loss of function. It is a condition which offers almost insurmountable obstacles to cure, unless its onset is detected early and measures taken at once to remove the cause. Once established, complete recovery is rarely secured, but not all cases are hopeless. Based on the experience we have had with neurolysis in our clinic, we believe that this procedure offers a very definite expectation of excellent results when used in properly selected cases and when done within six months, or even one year of the time of injury. Certainly no harm can come from the exploration of a nerve which is clearly damaged nor from instituting measures which at least favor the return of conductivity in a damaged nerve or nerves. The tendency today is to take the view that muscle damage alone is the cause of deformity and impaired function, and that nerve injury is of little or no importance. Certainly this is not true in all cases of Volkman's ischaemic contracture, and in all fairness to the patient a careful estimation of the condition present should be made, and in favorable cases a neurolysis done as soon as possible. Failure to do this may mean disaster to a patient in whom a useful hand might have been secured, and leaves us open to the criticism that everything possible had not been done to insure recovery.

DISCUSSION.

Dr. Paul McIlhenny (New Orleans): This paper is extremely interesting not only to those of us who are interested in correcting and preventing deformities but also to those who are interested in industrial and private surgery. It deserves our very serious attention. Prevention is naturally the goal to be striven for, but Dr. Dickson's splendid results from his method of treatment give us hope for ultimate function even in those cases which apparently come to us too late.

Dr. Bradburn (New Orleans): I agree with Dr. McIlhenny that it is particularly encouraging to see results in this type of deformity where

there is some nerve involvement. I thought it might be interesting to investigate what percentage of cases of injury developed this special complication, but unfortunately the hospital records are not so kept that I could discover the information. However, the records of the last six years from the special fracture service instituted at Charity Hospital in 1923 are more accessible, and from them I have discovered that in 6769 fractures treated during that time, only two were complicated by Volkmann's ischemic paralysis. Dr. Newell reported 2374 fractures in which only one such case developed, which gives us an average incidence of something like one to every 3,000. The condition is not always associated with fractures. In one very interesting case reported by Long it followed a hemorrhage into the fascia which developed in a hemophiliac. I myself observed a similar case, in the leg, in which hemorrhage occurred into the muscles as the result of a football injury. The essential pathology, as Dr. Dickson says, is a myositis, the nerve involvement is merely a complication. His experience, by the way, differs from that of the late John B. Murphy, who in 1914, at a meeting of the American Medical Association, reported 50 such cases over a period of 5 years, in none of which was the nerve involved. He was a strong advocate of tendon elongation, and reported excellent results from it. My own experience parallels Dr. Dickson's in the few cases which did not originate in the Hospital, but came in for treatment; nerve involvement was present in them all. As to prophylaxis, we have a standing order on our service that after the application of a cast in the closed reduction of a fracture, morphia is to be given only under the personal supervision of a physician; the relief of pain in this type of case is not left to the discretion of the nurse. Splints and bandages, however, are not always the cause. Bodenhauer reports only case in which no bandage had been applied, and in one of the cases I located at Charity, there had been no splinting of the limb.

Dr. Isidore Cohn (New Orleans): Sir Robert Jones in his most recent work on this subject very dogmatically declines to consider anything else but the muscular side of the situation, whereas most of us who have seen these cases will agree with Dr. Dickson that in certain instances, at least, there is an associated nerve injury. The only point on which I differ with him is a slight one, whether, in our teaching, we had not better stick to the old idea that the essential pathology is an interference with the venous return, and emphasize the fact that the nerve involvement is a secondary consideration. The division into two groups is a wise one for that reason. There can be no question that if there is nerve damage or interference with conductivity, neurolysis gives excellent results. I do not see how even a skeptic could fail to be convinced after seeing the excellent pictures Dr. Dickson has shown us.

Dr. Urban Maes (New Orleans): I am grateful to Dr. Dickson, not only because he has presented his subject in such an able manner, but also because he has taken Volkmann's ischemic paralysis out of the category of splint injuries. In years gone by we believed and taught that this condition was always the result of improper splinting or too tight bandaging. It was Dean Lewis who some years ago first pointed out that this was not true. For my own part, in discussing Newell's paper which has just been referred to, in which he reported some two thousand odd injuiries with only one example of Volkmann's ischemia, I made the point then that in many cases this condition due to what I chose to call a sub-aponeurotic hematoma. The hematoma may not always be present, but swelling from some cause is, and the sub-aponeurotic pressure is the important etiological factor. I mention this point again, because in the multitude of facts which Dr. Dickson brought out, it might possibly have been overlooked. Prophylaxis is the all important consideration in the treatment of the condition. When the typical initial signs of the condition appear, I would advocate the prompt removal of all dressings, and for my own part, I do not hesitate to make multiple incisions in the aponeurosis. Sometimes there is a free escape of blood, sometimes there is not, but I always feel that I have taken every possible step to prevent the establishment of a disastrous condition, which can only be checked by prompt recognition of its onset by immediate liberation of the sub-aponeurotic pressure.

Dr. E. S. Hatch (New Orleans): I want to add my vote of thanks to Dr. Dickson for giving us such an excellent presentation of this subject; and should like to ask him in closing to say a few words on tendon lengthening in these cases. Most of us do not find the method as effective as it is sometimes made out to be.

Dr. E. D. Fenner (New Orleans): I rise to emphasize two points. The first is that the young man just beginning his surgical career is extremely prone to under-estimate the importance of pain and swelling in a bandaged limb. This is apparently a very uncommon complication of injuries, but its outstanding lesson is that pain, numbness or swelling in a bandaged limb should be the indication for the instant release of the constriction present. The second thing is that, while I agree with Dr. Dickson that neurolysis is

a very beneficial procedure in selected cases, the impression should not be absorbed that it should be a routine procedure in every case of Volkmann's paralysis. A good deal of intelligence, of judgment and of experience is necessary to decide when it should be done. I might add one thing further. The statistics presented would lead us to believe that in spite of the enormous number of fractures handled in our hospitals, this is a very rare complication of them. That is quite true, but I think that the statistics presented from the local hospitals are misleading, for I know that I myself have seen two or three cases of this condition which I am sure have not been included in Dr. Bradburn's figures.

Dr. F. D. Dickson (Closing): Dr. Fenner in his remarks made one point which I desire to emphasize also. I do not think the statistics which have been quoted are quite accurate, for we cannot arrive at the incidence of this condition by an investigation of ordinary fracture statistics. I have operated on 16 cases during the last 7 years, but I have seen a total of 47 cases during that time, which came to me from all parts of the country. What the frequency of the complication is I cannot tell you accurately, but I think a conservative estimate would be 5 or 6 in every thousand fractures of the elbow. As to whether or not nerve damage is present in this condition, Dr. John B. Murphy to to contrary, I want to say that I have never seen a case which did not exhibit some nerve involvement. I have opened too many of them to make this statement lightly. I am a warm advocate of neurolysis for the first type of Volkmann's ischemic contracture, in which there has been only a moderate destruction of the flexor muscles, and I will even operate on patients in whom I suspect the nerve damage to be very great because I know I cannot do such individuals any harm, and I feel that I have frequently done them considerable good. The nerve supply of the undamaged muscle is a most important consideration in the cure; you cannot expect a muscle to function without a proper nerve supply any more than you could expect a garden hose to function if it were wrapped around by wire. I have had patients come to me who have been given a very gloomy prognosis in some of our best clinics, but in any case in which there has been only a moderate destruction of the flexor muscles, I do not hesitate to promise them some relief. It is the case in which only the bones of the forearm are left, in which the muscle is merely a mass of scar tissue, which I hesitate to touch. The boy to whom I have alluded represented such a type, and I undertook his case only because his family did not permit me to refuse it. For all practical purposes he had no muscles left. I did a neurolysis, and made two long tendons out of such isolated functioning muscle as I could find, transplanting the extensor tendons of two of the toes and running them down on top of the muscle mass. He can barely move his fingers, but that is more than he could do before, and that is something to have achieved in a case which looked utterly hopeless. In one or two instances I have shortened the bones because the contracture was so extreme I could not get the hand into hyperextension, and under such circumstances I prefer this procedure to tendon lengthening. Dr. Davis, with whom I was associated for many years in Philadelphia, was a great believer in tendon lengthening. I saw perhaps half a dozen cases so handled on his service, and I did one or two myself, but neither in his cases nor in my own did I think the results comparable with neurolysis, and I have long since abandoned the method. Lengthening of the tendons is an intricate procedure, particularly if, as often happens, there are dense adhesions to be dealt with, and better results are secured by less complicated methods.

PHARYNGO-ESOPHAGEAL DIVERTICULA: A GENERAL CONSIDERATION.*

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NEW ORLEANS.

Esophageal diverticula are not increasing in incidence, as the increasing literature on the subject would lead us to believe. They are simply being recognized with increasing frequency. Bell, in 1816, first called attention to them as a clinical entity, and the classification into the pulsion and the traction groups, which we still employ, was made by Rokitansky in 1840. In 1877 Zenker and von Ziemssen described the pharyngo-esophageal type with such precision that but little has been added to our knowledge of it since that time. A year earlier Nicoladoni, acting on the old suggestion of Bell, first attacked them surgically, by the creation of a fistulous opening into the sac, though it was not until 1890 that the first successful extirpation, for that matter the first successful operation of any sort, was performed by von Bergmann. At the present time, thanks to the roentgen-

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ray and the esophagoscope, these diverticula are being diagnosticated with little difficulty, while the appalling mortality of the early surgical procedures has practically disappeared with the employment of the two-stage method of extirpation, devised by Goldmann of Freiburg in 1909 and successively improved by C. H. Mayo and John B. Murphy.

There are two chief types of esophageal diverticula, the traction and the pulsion. Traction diverticula need not concern us long. They may occur at any point along the esophageal tube, though they are most numerous at the level of the tracheal bifurcation, where lymph nodes are most numerous, and they may be multiple. They are really simply a protrusion of the esophageal wall caused by the traction of surrounding structures which have been involved in some chronic inflammatory process terminating in cicatricial contraction. Most often this process is of tuberculous origin; less often the diverticula are the result of vertebral caries. They are usually symptomless unless, as occasionally happens, particles of food lodge in them, or, as has been reported in two instances, both in tuberculous patients, rupture occurs into the lung or the bronchus. Obviously they are of little clinical concern.

The pulsion type, on the other hand, is of greater clinical interest because it gives rise to definite symptoms. These pharyngo-esophageal diverticula, as they are more correctly termed, are located always in the same spot, the posterior wall of the esophagus, directly back of the cricoid cartilage, at the junction of the pharynx and the esophagus. There are two principal theories as to their etiology. They were long considered to be herniae of the mucosa and sub-mucosa of the esophagus, and to be caused by a weakness of the muscle and covering in this special area, which is called, after the investigators who first pointed out the supposed abnormality, the Lannier - Hackermann area. Chevalier Jackson, however—and his words carry the authority of a specialist who has performed literally thousands of esophagoscopies—does not consider the theory of congenital muscular weakness a reasonable one. Indeed, he believes that while the walls of the esophagus and pharynx are weak everywhere, they are rather better supported in the cervical than in the thoracic region. Pulsion diverticula, in his opinion, involve all coats of the wall, and all of them have a functional cause, an incoördination of the crico-pharyngeus muscle. This muscle, it will be remembered, has what he terms a "pinch-cock" mechanism, which, acting at the proper moment, relaxes the tonically closed upper end of the esophagus and permits the alimentary bolus to enter. If for any reason it fails to function, an unyielding barrier is presented to the advance of the food column, which, by its pressure, causes a dilatation above the pharyngo-esophageal junction, and this dilatation eventually develops into a true diverticulum.

The clinical aspect of pharyngo-esophageal diverticula is naturally our chief concern. They are most frequent in men and the syndrome is rather constant. Symptoms seldom appear before middle life, although Jackson and Shallow report one case, in their opinion of congenital origin, in which the patient, an unusually intelligent physician of 54 years of age, gave a definite history of definite symptoms extending over at least 40 years. As a rule, however, the patient is of middle age or beyond it, one of Lahey's patients being 84 years, and the average age in Judd's, Jewett's and Sturgeon's series being respectively 55, 63 and 64 years.

The onset is insidious and symptoms may be present for several years before medical advice is sought. There is first a sensation of dryness in the throat, then an increasing difficulty in the deglutition of granular food and finally of all food. As the sac increases in size and the esophagus is more and more occluded by external pressure, there may be a sensation of pressure, sometimes of

actual pain, referred to the base of the neck or the retrosternal region. There is more or less regurgitation of food, usually involuntary and often occurring during sleep, for the purely mechanical reason that, with the esophagus occluded by pressure, food taken after the diverticulum is filled must of necessity regurgitate into the mouth. Many of these unfortunate patients learn by experience that food can best be taken in the reclining position, with the head and neck downward, in which position the orifice of the sac is directed upward and food cannot enter it. Gurgling noises in the throat are an annoying feature, and often there is an irritating cough. These patients are peculiarly susceptible to respiratory affections, chiefly chronic bronchitis, due to the overflow of the pouch and the trickling down the trachea of irritating fluids. One of my patients, I might say in this connection, died a year after he had been surgically relieved of his diverticulum, of a terminal pneumonia superimposed on a purulent bronchitis with a bronchiectasis of both the tubular and the saccular varieties.

Diagnosis is not difficut. A patient who exhibits any or all of the above symptoms should be promptly examined by roentgen-ray, with the aid of a barium meal. The findings are usually conclusive, though it might be emphasized that examination in the oblique position as well as the anterior-posterior is a wise measure. This was well illustrated in the case reported by Fineman, in which carcinoma of the cardiac end of the stomach was reported in two radiographic examinations, but only in the third, in the oblique position, was the diverticulum observed, although it extended almost down to the diaphragm. Large diverticula are often visible externally, or may be palpated as the patient ingests food or fluid. Regurgitation of the food ingested while this maneuver is carried out is pathognomonic. Esophagoscopy should be routine, to eliminate stricture and carcinoma. These measures are so precise that there is no longer any reason for resorting to the older complicated, uncertain and often dangerous diagnostic aids.

The treatment of esophageal diverticula is essentially surgical. Palliative measures not only do no good, but are actually harmful in that they may cause postponement of the operation until the sac has become intra-thoracic, when its removal may be extremely difficult if not actually impossible. In the case reported by Fineman, for instance, to which I have just alluded, operation would have been very hazardous, for the sac extended through the posterior mediastinum almost to the diaphragm. In a similar instance in my own practice the diverticulum reached the cardiac end of the stomach. It was my intention to attempt its removal, but I deemed it wiser to do a preliminary gastrostomy, to eliminate post-operative difficulties; the patient was so well pleased with the results that he refused to permit me to extirpate the sac, and today, many years later, he is feeding himself entirely through the tube, taking nothing by mouth, and he still has his diverticulum.

The earliest surgery suggested for esophageal diverticula consisted simply of the creation of a fistulous tract into the sac, which was later removed, the esophageal opening being closed by sutures. The mortality, however, was formidable, both because the esophagus does not hold sutures well and because infected material, escaping between the stitches and following the cellular planes of the neck, found its way into the mediastinum, causing suppuration which almost invariably terminated fatally. Such a case as that recently reported by Norton from the Mayo Clinic is almost unique, in which recovery followed the development of a huge mediastinal abscess after the first stage of the double operation for diverticulum.

The second proposal was to invaginate the sac into the esophagus. This may be possible with small pouches, but it is impractical with large ones, and is extremely

dangerous besides. C. H. Mayo notes that in one case, reported by Bevan, in which this method was employed, the sac was forced upward in the act of vomiting and death ensued from suffocation caused by blocking of the trachea. Even if such a contingency does not come to pass, the method is obviously unsound surgically.

The accepted procedure today is complete extirpation of the sac, and the only question is whether the operation should be done in one stage or two. Jackson and his associates believe that the one-stage operation, done with the esophagoscope in position, is not only safe but is more likely to result in a permanent cure; they are opposed to the two-stage method because the second procedure must be done in inflammatory tissue. They report by their technique 15 cases with one fatality, that being due to a massive collapse of the lungs. From the Mayo Clinic, on the other hand, comes a report of 74 cases done by the two-stage method, with only three fatalities and with practically perfect final results in the remaining 71.

The operation itself is quite simple. The incision is made along the anterior border of the left sterno-mastoid muscle, where the sac is most accessible. The region of the esophagus is brought into view by careful anatomic displacement of the carotid sheath with its contained structures and the thyroid gland, and the sac is identified and by gentle traction is delivered up to its neck, at which point it is fastened by a few sutures either to the skin or to the sternomastoid muscle. About 12 days afterwards it is excised, the gap being closed with a few interrupted sutures and the neck wound being left open for drainage. Usually the space closes by granulation within three weeks; if a sinus should remain after this time, it ultimately closes by the employment of the usual methods. Post-operative roentgen-ray examination may show a slight pouching of the esophagus at the site of extirpation, but it is my experience that this in no wise interferes with deglutition.

No anesthetic is necessary for the second stage of the operation, and the first is best performed under local analgesia, chiefly that Willard Bartlett's suggestion may be put into effect, that after the esophagus is exposed the patient be instructed to close his lips and his nostrils and endeavor to blow out his breath. By this maneuver the sac is forced into the operative incision and its identification is facilitated. With the conscious patient, too, there is not the danger, pointed out by C. H. Mayo, that a sac which has been imperfectly emptied of food may relax under anesthesia and spill its semi-putrid contents into the trachea, thus exposing the patient to the danger of aspiration pneumonia if not of suffocation.

I see no advantage to Murphy's suggestion that the sac, on its delivery, be slightly twisted, a procedure which certainly introduces the possibility of necrosis from an impaired circulation. Lahey's point, however, is well taken, that the sac should be fastened in the incision in an upright rather than a horizontal position, thus avoiding its distention by food particles and its possible gangrene. The same author utters a warning that it must not be dragged too far out into the wound, in which case a dangerous angulation of the esophagus may be produced. For my own part, I would suggest that particular care be exercised in the choice of needles. In one of my cases I tore the thin wall of the pouch by the use of a needle with a large eye, and in spite of what I considered adequate drainage, the slight escape of fluid into the cellular tissues of the neck resulted in a cellulitis which was controlled with considerable difficulty.

These patients usually react excellently from the first stage of the operation. They are frequently able to be out of bed, and often they can swallow normally at once. If, however, they cannot take food by mouth, the introduction of a Levin or a Rehfuss tube quickly solves the problem, or, as Lahey suggests, it is even possible to feed them through a tube introduced into

an opening made in the apex of the sac and carried down into the stomach. These post-operative methods, plus the liberal use of fluids beforehand, by hypodermoclysis or infusion if indicated, make a primary gastrostomy seldom if ever necessary.

CONCLUSIONS.

1. The prompt recognition of pharyngo-esophageal diverticula, which is the most important point in their cure, can be achieved only by a closer coöperation between the surgeon and the nose and throat specialist, whom such patients usually consult first.

2. Their existence should be suspected in all patients who exhibit a chronic cough, dysphagia and regurgitation of food.

3. The diagnosis is simple with the aid of a barium meal and the roentgen-ray, plus esophagoscopy.

4. Two-stage extirpation of the sac under local analgesia is the treatment of choice. The operation is free from danger if care be taken to avoid aspiration pneumonia from the insufflation of infected food particles, and infection of the mediastinum by primary soiling or post-operative leakage.

BIBLIOGRAPHY.

Fineman: Long diverticulum of the esophagus. J. A. M. A., 90: 1943-1944, 1928.

Halstead: Diverticula of the esophagus. Surg. Clin., Chicago, 3:667-680, 1919.

Jackson and Swallow: Diverticula of the esophagus, pulsion, traction, malignant and congenital. Ann. Surg., 83:1-19, 1926.

Judd: Esophageal diverticula. Arch. Surg., 1:38-52, 1920.

Lahey: The technique of the two-stage operation for pulsion esophageal diverticulum. Surg. Gynec. and Obst., 43:359-365, 1926.

Mayo: The treatment of diverticulum of the esophagus. Trans. South. Surg. Assn., 35:168-175, 1922.

Norton: Esophageal diverticulum; report of a case with complicating mediastinitis. Staff Proc. Mayo Clin., 4:34-35, 1929.

Pumpelly: Pharyngo-esophageal diverticulum; case report. South. M. J., 21:1021-1026, 1928.

Sturgeon: Esophageal diverticula. J. A. M. A., 92:379-385, 1929.

Dr. Urban Maes, following the presentation of his paper on Esophageal Diverticula, exhibited slides demonstrating the appearance of one of these anomalies, the method of incision and exposure in the first stage of the two-stage operation of complete extirpation, and the maneuver, suggested by Willard Bartlett, by which the patient, during the operation, is instructed to close his lips and nostrils and endeavor to blow out his breath, by which means the diverticulum is forced into the operative wound.

In closing his remarks, Dr. Maes emphasized again the wisdom of employing this simple method of identifying the sac of the diverticulum, and pointed out that it obviated the use of instruments in its delivery, thus lessening the chance of tearing its wall and causing an infection of the cellular tissues of the neck, which might result fatally.

LATERAL SINUS THROMBOSIS*

A REVIEW OF THE LITERATURE AND REPORT OF FOUR CASES

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That the etiology of lateral sinus thrombosis is nearly always secondary to a suppurative process in the middle ear and mastoid process there is little doubt. The so-called "primary" thrombosis is of the jugular bulb with no intervening suppuration in the mastoid process seems rather unsettled from a review of the literature.

The incidence of occurrence of lateral sinus thrombosis in acute and chronic suppurative mastoiditis is fortunately not so frequent. Hill reports 7 in 166, Downey 5 in 79, Gerber 25 in 524, Welty 3 in 300, Mass. Eye and Ear Infirmary 19 in 497, Manhattan Eye, Ear, Nose and Throat Hospital 11 in 588. In our series at The University of Virginia Hospital, of the mastoid cases acute and chronic admitted to the hospital during 1927, between five and six percent were complicated by lateral sinus thrombosis. That it occurs much more often than diagnosed is certain since many cases

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presenting a typical picture of sinus thrombosis get well spontaneously without operative intervention. Day reports 45 cases of lateral sinus thrombosis with spontaneous recovery in six cases without operative interference. Phillips states that spontaneous recovery takes place with comparative frequency.

The mode of infection is perhaps best summarized by Phillips, and may be "(1) Through anatomic dehiscence in the bony tissue of the parietal wall, (2) by direct extension of the purulent lesion of the bone, (3) by involvement of the smaller veins of the diseased bone, (4) by involvement of the intermediate anastomotic veins in the thrombotic area."

The peculiar anatomy of the lateral or transverse sinus renders it more liable to infection than any other of the dural sinuses, since it is closer to the surface in an area of potential infection in the mastoid portion of the temporal bone, and since it is *intradural,* i. e., covered by a half thickness of dura, whereas other dural sinuses are covered by a whole thickness. The part of the lateral sinus most often involved is the knee, or beginning of the sigmoid sinus just below the entrance of the superior petrosal sinus, since it is more superficial at that point and in closer contact with the mastoid cells. The right lateral sinus is more often involved than the left due no doubt to differences in anatomy. Both lateral sinus may begin by a division of the superior sagittal and straight sinuses at the torcular herophili grooving the internal occipital protuberance, and from there grooving the occipital, parietal, and temporal bones respectively, ending in the jugular bulb on either side. More often however the left is a continuation of the straight sinus which drains the interior of the brain by way of the great vein of Galen and the inferior sagittal sinus. Whereas, the right begins at the torcular herophili as a continuation of the superior sagittal sinus which drains the superficial surface of the brain by way of the superior cerebral veins and the superior sagittal sinus. The principal affluents of the right lateral sinus then are (1) the superior sagittal sinus which receives blood from the diploe veins of the skull, the meningeal veins, the superior cerebral veins, and emissary veins which communicate through the parietal foramen with the veins of the scalp, and through the foramen cecum with the veins of the nasal cavity; (2) the superior petrosal sinus which drains the orbit and pterigoid plexus by way of the cavernous sinus; (3) emissary veins which communicate through the mastoid foramen with the occipital veins, through the condyloid canal with the deep veins of the neck, and through the hypoglossal canal with the deep veins of the neck. The affluents of the left lateral sinus differ from those of the right only in the affluents of the straight sinus which drains the interior of the brain through the great vein of Galen and the inferior sagittal sinus. If then, as claimed by most workers, thrombosis is nearly always due to intra-sinus infection, the right lateral sinus would be more liable to infection and thrombosis since it receives the surface drainage, and would be more often affected by inflammations of a localized character affecting the meninges.

The type of infection in lateral sinus infection and thrombosis is almost invariably a hemolytic streptococcus, and is most likely to be encountered in suppurative mastoiditis complicating measles and influenza.

The pathological process is usually a periphlebitis, phlebitis, endolphlebitis, thrombosis, general bacteremia, usually in the order named. The vein wall may look perfectly normal, however, and yet be thrombosed. On the other hand it may be surrounded by a perisinus abscess and covered with granulations and yet contain no thrombus. The type of thrombus is usually of the mixed variety. In extent it may be mural and not occlude the sinus, or it may obstruct the lumen and be so extensive as to reach from the torcular herophili to the

jugular bulb and even invade communicating sinuses. The subsequent or secondary changes in the thrombus or clot may be liquefaction or softening due to infection, or organization. Pathology elsewhere in the body incident to or accompanying lateral sinus thrombosis may be (1) Bacteremia, which many writers say is always present at some stage of thrombus formation as evidenced by positive blood cultures (Naftger, Oppenheimer), while others (Kopetzky) say one may have repeated negative blood cultures with thrombosis of the lateral sinus or internal jugular vein; (2) Metastatic abscesses which may be intracranial, i. e., brain abscess or purulent meningitis, or visceral affecting most often the lung, joints, kidney and spleen. Nephritis is almost constant, endocarditis is frequent, and papillitis sometimes occurs.

As to the time of occurrence of lateral sinus thrombosis following mastoiditis, I believe I may safely say that it may occur almost at the onset, or it may be days or months after the acute attack. There are certain types of cases, however, in which one should always be suspicious of a complicating lateral sinus thrombosis following a mastoid operation: "(1) In painless cases of mastoiditis where a hemolytic type of infection is present accompanied by a perisinus abscess; (2) If the primary lesion reaches to and includes the sinus at the primary mastoidectomy, and later untoward symptoms develop that cannot be accounted for elsewhere." (Kopetzky.)

The diagnosis in typical cases is fairly easy, but in atypical cases may be most difficult. Atypical cases are more apt to occur in children as a review of the literature will show. Diagnosis in typical cases is based on the clinical picture, and positive blood cultures, keeping in mind of course the history of the case. The typical clinical picture is obvious to all, but many cases do not present the typical picture. To summarize all the useful diagnostic criteria which may be resorted to in atypical cases of difficult diagnosis we have: (1) The clinical picture, which may be very useful, or useless, in suggesting a diagnosis; (2) Positive blood cultures which nearly always indicate a sinus involvement in cases of this kind, yet repeated negative cultures do not exclude thrombosis. Duell and Wright report 57 cases with positive blood cultures in only 16, about 28 per cent; (3) A leukocyte count around 20,000 with the greatest increase in polys. One of our cases had a leukocyte count of only 8000, while the average count in Kopetzky's cases was 27,000 with the highest 39,000; (4) Tenderness over the mastoid emissary vein below the tip of the mastoid process and over the internal jugular; (5) Crow's sign: Pressure over a normal internal jugular produces a dilatation of the veins of the forehead, temple and retina; (6) Mahler's symptom: A step-like rise in pulse rate. Heidemann reports six cases of latent thrombosis recognized by this sign; (7) Appearance of the sinus wall, i. e., necrosis or sloughing spots, and lack of pulsation on palpation. Neither of these is reliable, but may be useful in some cases; (8) Aspiration of the sinus contents under strict asepsis may be especially useful in cases of double mastoiditis when the sinus involved has to be decided. If no fluid is obtained on one side the assumption is that is the side thrombosed. Bacterial counts and cultures from the two sides may also be helpful in determining the side involved (Kopetzky, Phillips); (9) Stiffness and retraction of the neck on the affected side. This occurred in one of our cases; (10) Tenderness and enlarged glands at the angle of the jaw (Campbell); (11) Queckeustedt's test: as applied by Tobey in a series of 84 cases consists of "placing the patient in a lateral position, lumbar puncture is performed and fluid allowed to run into a manometer of 2 mm. bone. The initial pressure reading is noted, also presence of pulse and respiratory oscillations. Then the head is extended by an assistant and gentle pressure applied between the larynx and sternocleidomastoid muscle

until he feels a strong carotid pulsation during compression. The operator watches the rise of the fluid column of the manometer, promptness of beginning, and height it attains, and on release of jugular compression rapidity of drop in pressure. The procedure is repeated on the opposite side of the neck and then compared with both sides pressed simultaneously. In typical cases of lateral sinus thrombosis there is a prompt rise of fluid pressure to two or three times the initial reading when the internal jugular vein draining the normal sinus is compressed. The pressure rise is normal, being equivalent to the pressure attained when both jugular veins are compressed. Pressure over the vein draining the thrombosed sinus area causes either no rise, or more commonly a slow rise of from only 10 to 20 mm. in the manometer. These findings are characteristic of complete obliteration of the sinus. Partial obstruction from mural thrombosis naturally gives less striking results." This test was characteristically positive in two of our cases, and should be applied in the diagnosis of all difficult cases; (12) Spinal fluid examination is of little value as shown by Smith and Ayer.

The time allotted to this paper will not permit a discussion of the differential diagnosis.

In the treatment of lateral sinus thrombosis the most important measures are (1) early operation, (2) blood transfusions. The choice of operation is in the main two: (1) Phlebotomy of the lateral sinus and ligation of the internal jugular vein in the neck; (2) Phlebotomy of the lateral sinus with ligation and resection of the internal jugular vein in the neck. There is a question as to whether the sinus should be opened first, the thrombus curetted away, bleeding controlled, and then a ligation of the internal jugular vein in the neck, or whether the internal jugular vein should be ligated before opening the thrombosed sinus. Naftzger exposes and opens the sinus before doing the ligation. The safer plan it seems to me would be to ligate the internal jugular vein before opening the sinus to prevent the mechanical dissemination of infected emboli into the free circulation. As to where to ligate the internal jugular there is no doubt that the ideal would be to ligate the internal jugular below the entrance of the facial, and also to ligate the facial vein, and this was the choice in our cases. Phillips says that it is easier to ligate below the facial, subjects the patient to a less lengthy operation, and accomplishes every required purpose.

As to the value of blood transfusions, a review of the literature shows that many cases have recovered with blood transfusions alone with no operative intervention, although, it is not my aim to advocate it alone without operation.

CASE REPORTS

Case 1. Mrs. B. K., white female, aged 33 years, was admitted to the hospital April 16, 1927, complaining of discharge from the right ear and deafness on that side since childhood. She was discharged well on May 15, 1927.

Since childhood the patient had had frequent earaches and a discharging right ear for varying intervals, and almost complete deafness in the right ear. One year ago following influenza the discharge became more profuse, accompanied by severe pain over the right mastoid, followed soon after by a remission. Since January (4 months ago) there has been almost continuous discharge of thick yellowish exudate with an offensive odor and intermittent pain over the right mastoid. There was no trouble with the left ear.

On examination the canal of the right ear was filled with purulent discharge. The drum showed a large perforation with a discharge from the middle ear. The upper teeth were carious. A loud blowing systolic murmur was heard all over the precordium, loudest at the apex. There was no cardiac enlargement; rhythm was normal. Temperature on admission was 99.2°, pulse 93, respiration 20.

Laboratory findings: Urine negative, W. B. C. 8000, Wassermann negative.

Diagnosis: Chronic mastoiditis.

Treatment: On April 16, under gas-ether anaesthesia, a radical mastoidectomy was performed. The lateral sinus was found located extremely superficial, and was exposed during the

process of chiseling the outer cortex. The cells overlying the plate were very sclerotic. The dura was exposed in the middle fossa. The usual closure without drainage except through the ear canal was done.

Progress: Patient did well until five days after the operation, when the temperature rose to 104.4° following a chill, with the patient extremely uncomfortable. There followed a sharp remission of the temperature with another rigor and temperature again to 104° twelve hours later. Blood cultures were negative; WBC. 7200. On April 23, the old mastoid wound was reopened and the sinus exposed. The internal jugular was isolated and doubly ligated below the facial, and cut between ligatures. The lateral sinus was then incised and found to contain an infected thrombus, which was curetted away until free bleeding was obtained above and below. The bleeding was controlled, the wound packed and left wide open. A Dakin tube was placed through the canal of the ear deep into the middle ear. The neck wound was closed with drainage. On the day of the second operation the patient received a blood transfusion by the citrate method, and another on the following day.

Highest temperature after operation was 99.4°, wound healed rapidly with no complications. Radical cavity healed in one month. Patient discharged well.

Case 2. V. E., a white male, aged 11 years, was brought to the hospital acutely ill July 12, 1927, by his family physician. He died July 30, 1927.

He was a sickly child and had had ear trouble all his life. Both drums had been opened several times and had drained almost continuously for several years. He was comparatively well until two weeks before admission, at which time the patient developed an acute coryza, accompanied soon after by pain in right ear. Three days later the pain became so severe patient was taken to family physician who did a myringotomy on the right side. The temperature dropped immediately and drainage was profuse. The temperature two days later rose to 103° following a chill, there was a remission in temperature and a chill with high temperature on the following day. The patient was brought to the hospital on July 12, at 1:00 a. m.

The temperature on admission was 103.5°, W.B.C. 16,000, Hb. 50, neck stiff on right side. There was marked tenderness over the right mastoid area. Chest examination was negative. A lumbar puncture revealed increased spinal fluid pressure, but otherwise normal spinal fluid. Queckenstedt test negative for sinus thrombosis. The right ear drum was perforated and the ear was draining profusely. The left ear drum was thickened and retracted. The right antrum was cloudy on transillumination. The teeth were carious. Cervical adenopathy was present on both sides. The abdomen was fairly rigid, but no spasm of tenderness was present over any point.

Diagnosis: Acute mastoiditis, right; empyema right antrum; suspicion of lateral sinus thrombosis.

Treatment: A simple mastoidectomy was performed on the right side soon after admission. Bone involvement was found to be very extensive the sinus plate was fairly healthy looking. The sinus and dura was not exposed.

Progress: Patient continued to run a septic temperature with one or two remissions each 24 hours with chills and sweats until seven days later. Highest exacerabation of temperature was 105°, and lowest a little above normal. The blood cultures showed Streptococcus hemolyticus. At this time the lateral sinus was exposed and opened after first ligating the internal jugular and facial veins. Free bleeding was obtained from the upper end of the sinus, while the lower end bled only sluggishly. No definite thrombus was found. The wound was packed lightly with no attempt at skin closure. The neck wound was closed with drainage. The day following operation the patient received a blood transfusion and temperature rose to 106°. A rather marked facial and cervical edema developed on that day which could not be accounted for. He received another blood transfusion on July 24, and a third on July 29. He continued to run a stormy course with rigors and high exacerbations of temperature once or twice each 24 hours, sometimes going as high as 108°, with remissions ofttimes below normal. Died July 29.

Case 3. R. W., a white male, aged 6 years, was brought into the hospital July 9, 1927, with a profusely draining right ear, temperature 102°, acutely ill, a visible swelling behind the right ear.

The present illness dated back nine months, at which time the patient was admitted to the hospital with a discharging right ear of some three years duration. The examination at that time revealed an absence of the right ear drum and a middle ear filled with pus and granulations. A simple mastoidectomy was performed without exposure of the dura or sinus. A radical operation was advised at that time. Following discharge from the hospital at that time there has been almost continuous discharge from the right ear. Two days before the present admission pa-

tient began to complain of pain in the right ear, and a visible swelling appeared over the old mastoid incision.

Physical examination was negative except for a profusely draining right ear, absence of the right ear drum and the middle ear filled with cholesteatomatous material, and a red fluctuating area behind the ear.

A secondary mastoidectomy was performed. No fistulous tracts or necrosed bone found.

The patient ran an uneventful postoperative course for 8 days at which time he had a chill and the temperature rose to 102°, WBC 16,000, chest examination negative. The day following patient had another chill and temperature rose to 104°. In spite of the high temperature patient did not complain and showed little restlessness. Blood cultures negative. Spinal fluid pressure increased, and Queckenstedt test positive for lateral sinus thrombosis on right side.

At that time (10 days after secondary mastoidectomy) the old incision was reopened and a radical mastodectomy performed on the right side. The sinus plate had an unhealthy color, although intact. The sinus was exposed and opened after ligation of the internal jugular and facial veins, and found to contain a large infected thrombus extending upward toward the torcular and downward toward the jugular bulb. The thrombus was curetted away, and bleeding controlled. The wound was packed lightly with no attempt at skin closure. The neck wound was closed with drainage.

In spite of repeated blood transfusions, the septic temperature continued with one or two remissions each 24 hours, with chills and sweats until June 18 when patient died.

Blood cultures were repeatedly negative, whether taken during temperature remissions or at the height of exacerbation.

Case 4. M. W., a colored female, aged 44 years, was admitted to the hospital December 10, 1927, complaining of pain in the left ear. Discharged well January 12, 1928.

The present illness dated from September 1, 1927, when the left ear began to ache. This was relieved by paliative treatment. Two months later the same ear began to ache again and about ten days later ruptured spontaneously and began to discharge. A lump appeared behind the left ear which broke down and began to suppurate.

Physical examination revealed a well nourished female with noticeably poor hearing. The right ear drum was retracted and smooth. The left ear canal was filled with pus, drum thickened and perforated. The left fundus showed some edema. A suppurating wound was present over the left mastoid. Otherwise negative. Leukocytes 9600, RBC 4,200,000, Hb. 60, Wassermann negative, urine negative.

Diagnosis: Acute mastoiditis, left.

Three days later a simple mastoidectomy was performed which revealed a fistulous tract from the mastoid area through the outer cortex. The mastoid cells were filled with pus and granulations. The sinus plate was necrotic and surrounded by pus. The wall of the sinus was thickened and covered with granulations. After complete exenteration of the mastoid cells the lateral sinus was incised and a thrombus found completely occluding it. This was removed except at the lower end where it was found to be completely organized. Jugular ligation was not considered necessary. Patient made uneventful recovery.

SUMMARY.

The interesting phases in case 1 were the low leukocyte count, thrombosis following a radical mastoidectomy, negative blood cultures, and an uneventful recovery.

The interesting phases in case 2 were lateral sinus thrombosis, no doubt, on admission, positive Queckenstedt test, post-operative facial and cervical edema. Kopetzky reports a similar case, but offers no satisfactory explanation for the edema.

The interesting phases in this case were the time which elapsed between the primary mastoidectomy and development of lateral sinus thrombosis, and repeatedly negative blood cultures.

The interesting phases in case 4 were the lack of any septic symptoms, low leukocyte count, an organized thrombus, uneventful recovery.

EXPERIMENTAL OBSERVATIONS UPON POST-SCARLATINAL NEPHRITIS.*

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NEW ORLEANS.

One of the most interesting nephritides of man is that occurring as a sequel in scarlet fever, and commonly spoken of as afebrile post-scarlatinal nephritis. In these cases the symptoms of scarlatinal infection have passed and recovery has apparently been established when grave renal disturbances appear unaccompanied by fever. It is generally held that the new nephritic symptoms which appear weeks after convalesence from scarlatina are not those of a secondary infection or late manifestations of the disease. However, its cause and manner of production are imperfectly understood by both pathologist and clinician.

Based on clinical and laboratory investigations Longecope suggests that post-scarlatinal nephritis is the result of persisting foci of the specific streptococcus in some part or parts of the upper respiratory tract and adjacent spaces, as for example the tonsils, posterior nares, sinuses, etc. This author could not, however, obtain evidence that the streptococcus *per se* caused the late nephritis by actual invasion of the kidney from the blood stream, though the evidence was sought after by culturing the blod and urine from a large number of post-scarlatinal cases. Furthermore he was unable to demonstrate streptococci in the tissue sections or in culture from the kidneys of these patients. He did obtain evidence in the way of positive cultures from the throat that lead him to suppose that persisting foci of scarlatinal streptococci were responsible for the late nephritis, on the supposition that the toxin from these foci is absorbed and during its elimination by the kidney causes the renal changes. This presupposes that the immunity established in scarlet fever is lytic and not antitoxic, otherwise the toxin that is absorbed subsequently would be neutralized in the blood stream and thus rendered inert before reaching the kidneys.

In order to obtain more light on this interesting sequel to scarlet fever, and especially as regards its causation and manner of production, we have carried out a series of experiments upon the dog, employing the living culture, killed culture and toxic product of the scarlatinal streptococcus as the nephrotoxic agent. The dog was used by choice because this animal is extremely susceptible to infection with this microorganism, and also to its toxic product which commonly produces a grave nephritis.

The acute nephritis induced in the dog with scarlatinal streptococci or their toxic product is essentially of two forms, parallel in every way to the two types described for man. The work was carefully controlled, using only animals known to be free from nephritis, as determined by daily examinations of the urine and kidney function tests. The toxin produces an acute glomerular lesion, while the living culture gives rise to a lymphocytic infiltration of the interstitial tissues of the kidney.

The kidney lesions occur during the infection, and may also be induced in the recovered animal several weeks later by injections of the toxin or large amounts of living culture without causing reinfection.

The subsequent behavior of recovered dogs that had received the living culture or its toxic product affords considerable proof that the toxin of scarlet fever is endotoxic in character. Animals that had recovered from the infection could not be reinfected with the same dose of the homologous living culture. However, if the recovered dog was given a very large dose of living culture, or a large dose of toxin, the animal

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developed a severe toxemia and acute hemorrhagic nephritis in a few hours. It is noteworthy for the animals that had received living culture, though highly toxic, did not become infected, as was evidenced by negative cultures from the blood and internal organs.

It would appear from the results of these experiments that scarlatinal streptococcal infection in the dog produces a lytic rather than an antitoxic immunity. If this is true for scarlatinal infection in man it is logical to suppose that the persistence of hemolytic streptococcal foci upon the mucous membrane of the upper respiratory tract, middle ear, sinuses, and so forth, would be the source of an intermittent supply of streptococci to the system, and that through the action upon them by an already existing lytic substance, a toxic product would be produced which affects the kidney, and largely because this organ is concerned in its elimination.

In explanation it would seem that the original dose of toxin or living culture given to the animals, causes the production of a lytic immunity. While such an immunity protects against a second infection, it is the means of inducing a more severe toxemia than was the case during the primary infection. Presumably the lysin produced in the dog originally, splits the second dose of living cocci, liberating therefrom a complex endotoxic product, which in the absence of sufficient antitoxin is free to act upon the kidney. Likewise, when toxin is injected it is free to act immediately upon the kidneys in a manner altogether similar to that of the toxin produced by the action of the lysin upon the living organisms.

The survival of scarlatinal streptococci in certain parts of the upper respiratory tract after the infection is over, may be explained partly on the ground that the micro-organisms are near the surface of the mucous membrane in direct contact with the outer air, so that escape outward is readily effected through destruction of tissue, hence they are protected from the immune substances of living tissue. It may be assumed that with the invasion of the tissues in the early stages of scarlet fever, it became necessary for the invader to concentrate its powers in its immediate vicinity. For this purpose the product of streptococcal disintegration is of use in protecting the focus of infection by causing necrosis of the adjacent tissues.

The results of our experiments upon young dogs are positive proof that afebrile post-scarlatinal nephritis, in the dog at least, is caused by streptococcal toxin and is not the result of retained viable streptococci in the kidneys. In the recovered experimental dog which has been infected with living cultures of scarlatinal streptococci, a second or third dose of toxin produces a severe and often fatal acute hemorrhagic glomerulonephritis, which in every way corresponds to the afebrile post-scarlatinal nephritis of man. The animals tested before administering the toxin showed more or less lytic immunity; that is, a specific streptococcal lysin was demonstrable in the blood serum, and in consequence the animals could not be infected with the same dosage of living culture that had infected them originally.

Aside from the question whether it is a particular variety of hemolytic streptococcus that is the primary excitant of scarlet fever, the results of animal experimentation afford proof that streptococci are responsible for the acute glomerulonephritis during scarlatinal infection and also cause through toxic action the so-called afebrile post-scarlatinal nephritis.

The deductions to be drawn from these experiments are that persons who have recovered from scarlatinal infection, though lytically immune are not apparently anti-endotoxically protected against the toxic product of the scarlatinal streptococcus. Therefore, the toxin, which may be derived from persisting foci of the specific infection, is free to act and does

so upon the kidney effecting particularly the glomeruli. Thus by analogy may be explained the cause and manner of production of afebrile post-scarlatinal nephritis of man.

Dr. W. H. Seemann (New Orleans): I don't believe it would be fair to ourselves to neglect an opportunity to discuss this paper and emphasize some of the points. There is one thing that should appeal to everyone here whether he be a pathologist, clinician, surgeon or just a plain, ordinary citizen, the father of children.

My experience with all infectious diseases is that 99 per cent of physicians seem to believe that clinical recovery means complete histological recovery, which Dr. Duval's paper has further proved to emphasize as a false conclusion. Long after a child is up and around there will be destruction going on, lack of repair throughout the system and especially, as Dr. Duval has so strongly pointed out, in the kidneys.

The average child who is willing to remain in bed, or who goes to bed willingly, is an extremely sick child. My own past clinical experience has proved that to me. The minute a child is half way able to get up, he is willing to get up. I will say that 99.9 per cent of cases of scarlet fever do not have a close recovery control over the urination excretions in scarlet fever. Not only in scarlet fever, but in diphtheria, that should be emphasized. Here is one of the best opportunities of prevention. We have been too late to prevent the disease, but we can prevent the many sequelae by careful care of the patient and careful attention to examinations.

In regard to the other point Dr. Duval brought out with reference to foci of infection, I had a good deal of experience with diphtheria, and a good deal with scarlet fever. My opinion is, in 50 per cent of the acute infectious diseases on clinical recovery, the causative organisms are readily thrown off by the human body, provided no defects exist, and provided no bad sinuses exist where surgical corrections are needed. Then you will find persistent infection by the bacilli of diphtheria or the streptococci of scarlet fever.

There is another important point. Cultural methods, of course, ought to be substituted for the archaic method of watching skin desquamation. I don't know whether there is possibility of desquamation of the skin due to infection, but I think when there is infection it is due to contamination of the upper respiratory tract. I think the time is coming—we are doing it on a small scale—when sanitary control will be by the taking of cultures. When these cultures persist beyond a reasonable time, it shows there is some repair work necessary.

Another thing: I don't believe facts have substantiated up to now a firm conclusion on that point—I believe that while immunity, if derived in scarlet, is lasting as far as a typical second attack of scarlet, the work shows it does not immunize a human against the invasion and possibility of destructive processes by that organism again.

There is another point I wish to emphasize. I believe that Dr. Duval made that point, and if he didn't, I should like to be corrected. I have always been a firm believer, despite the work that the Dicks have done, that the antitoxin suggested by Dochez is far superior because in it the streptococci are used as the antigen, and in that way not only antitoxins are produced but lysins are produced, as Dr. Duval has brought out, and they are very necessary.

I should like to know—I didn't hear anything in the doctor's paper—whether he made any experiments in these animals to see when he found a beginning nephritis whether the further use of antitoxin, I mean in the later stages after the clinical recovery, would be beneficial in retarding the advancement of this condition. It certainly would be a helpful discovery if we knew that and if there was some method by which we could further fortify the patient by additional doses of antitoxins.

I should like to inquire whether he has any figures in regard to the length of immunity. As far as the paper has brought out, there does not seem to be any prolonged antilytic immunity or antitoxic immunity. There seems to be, possibly, some anti-streptococcic immunity—I mean as far as preventing the invasiveness of the organisms. Those are the main points.

Of course, we are all very interested in this problem as we are in all problems affecting child health, and we luckily do not get, in my opinion, the severe cases of scarlet fever that we used to get, although we do, on occasion in exceptinal cases, get pretty bad cases.

The old-time scarlet fever, due to lack of understanding of the mode of conveyance of the infection, and due to crowding and worse housing facilities, and what not, used to be a terrible thing. When I first started to practice I saw some cases of scarlet fever that were absolutely terrifying in their severity, and which were in a great percentage of cases fatal.

I certainly think this is a very timely subject, and I am glad I had the opportunity of listening to the paper.

Dr. I. I. Lemann (New Orleans): I am interested in Dr. Duval's work from another point of view. The whole field of nephritis is still quite clouded as to a proper classification. It is work such as this that will, as time goes on, give us more opportunity to form a clearer conception as to the nature of the various nephritides.

Dr. Duval's work is even more important than the work of Christian and others who have worked with unusual substances causing nephritis as, for example, uranium nitrate which is not likely to be the cause of human nephritis.

On the other hand, Dr. Duval's work naturally covers but one kind of nephritis, namely, a nephritis following a bacterial invasion. The clinician realizes that not all nephritis, particularly the long lasting insidious forms, can be regarded in the light of our present knowledge as comparable to the toxic nephritis represented by the studies of Dr. Duval. The time has come for us to discard the old conceptions that satisfied the clinician for a longtime of acute nephritis, chronic parenchymatous and chronic interstitial nephritis. Too many things have come up to cause dissatisfaction with these terms and with the conceptions that underlie them.

It is to be hoped that Dr. Duval, and other workers in the field, will be able to devise other methods for investigating the types of nephritis that we see come on in middle age and which cannot be correlated with bacterial invasion either from an acute disease or from some focus of infection.

Dr. A. A. Herold (Shreveport): In order to get a clear conception of what is termed "Post-Scarlatinal Nephritis," I should like to cite a case that came under my observation about three years ago and ask Dr. Duval to give me an opinion as to whether or not it was such a case.

I was treating a child with a rather severe attack of scarlatina. I gave the other children of the household passive immunization with serum. At that time it was comparatively new. Shortly thereafter the mother developed scarlatina. For fear some of the other children might be exposed after the period of the immunity from the serum had worn off, I started the other children on active immunization with the vaccines. In three days after the time I completed the vaccine, one of the children developed a low-grade fever and rash, followed by slight desquamation. A few weeks thereafter the family noticed swelling of the hands and feet of this child which had the slight fever, and one morning they called me suddenly. The child was having a violent convulsion, was quite edematous, and at that time had developed fever which it hadn't had previously, due, as I figured, to the uremic toxemia accompanying it.

I contended that that was a case of post-scarlatinal nephritis and that the child had had an attenuated case of scarlatina due to the serum and vaccines. The consultant pediatrician in the case said it wasn't scarlatina at all, that the child was having a toxic nephritis from the vaccines due to the irritating effect. I should like to get an opinion from Dr. Duval.

Dr. R. G. Douglas (Shreveport): I should like to thank you all for this most illuminating paper full of valuable thought, most of which is entirely new to me, and I want to take advantage of this opportunity of asking a question instead of buttonholing the doctor in the corridor after he goes out.

I recently lost a case of post-scarlatinal disturbance. The child came in with convulsions and coma and responded very promptly to the specific measures that we used. She came out of the coma within eight hours. Within four days the kidneys had cleared up with nothing in the urine, perfectly clear of albumin and cases. Her blood chemistry was normal. She started this renal attack, in three or four days began to decline and died within a week from a death that we thought was hepatic.

I want to know if the doctor, in his experience, found any hepatitis, and whether death was finally due to liver failure.

Dr. Charles W. Duval (New Orleans): In answer to Dr. Seeman, I first wish to say that, while I have had no experience with the use of scarlet fever antitoxin, either the Dochez or the Dick and Dick products, except in an experimental way, I am led to believe by clinicians of experience that the anxtitoxin has little value if any in the cure of scarlet fever. On the other hand, scarlatinal vaccine is of considerable value in the determination of susceptibility and immunity. Again the vaccine has great prophylactic possibility. The virtue of the vaccine lies in the fact that it produces an active immunity which is enjoyed for a period of months and perhaps years. Here is should be stated that the immunity to scarlet fever like typhoid is lytic and not antitoxic, which explains why antitoxin is of no greater value in the cure of scarlatina than it is in typhoid fever. The clinicians are too prone to regard scarlatinal antitoxin as having the same curative value as has diphtheria antitoxin. These two sera are immunologically different in their action in that one is lytic and the other is antitoxic.

The most important feature of scarlet fever is, in my opinion, the nephritis, since renal disturb-

ances, functional and structional, occur in practically ever case. Even in the mildest form of the disease, those in which there is no exanthem, the nephritis may be the only symptom. Again, the nephritis may not even be noticeable upon ordinary examination of the urine or even the functional test of the kidney.

It is interesting to know what occupies the clinical field at death in scarlet fever. In the majority of cases it is not the specific streptococcus *per se* that kills but the toxemia which effects by predelection the heart muscle and kidneys. Only in the case which has become septicemic can we say that the streptococcus is the direct cause of the mortality. We believe that the kidneys more often feel the blunt of the toxin than any other tissues because they are concerned with the elimination of the poison, and that the poison has an affinity for renal tissues.

In answer to Dr. Lemann regarding the long insidious forms of nephritis not comparable to the known toxic nephritides, I would like to know if the doctor has in mind the nephritides of the third and fourth decades of life that are ushered in without apparent cause?

Dr. Lemann: I mean the degenerative types of the fourth, fifth, and sixth decades of life, otherwise known as Bright's disease.

Dr. Duval: While we have no proof, most of us are of the opinion that in nephritis of Bright's disease there can be obtained a history of some previous streptococcal infection though not necessarily scarlatina which occurred years before, and perhaps as long ago as childhood. It is logical to suppose that during the streptococcal infection the kidneys were damaged. Later this damage was repaired and the renal function returned to normal. However, in the years to come the organs were unable to maintain their normal function and in consequence there developed clinical signs of nephritis. Karsner has shown that, in order to have signs of nephritis, more than 50 per cent of the glomeruli of the kidney have to be out of commission. With this in mind we can readily appreciate why there should be a period of years between the primary streptococcal infection and the inauguration of the Bright's disease, since symptoms of functional disturbances are not in evidence before a certain amount of the renal parenchyma has been destroyed..

In considering the etiology of Bright's disease we should always think of some previous streptococcal infection. Many of these infections are focal in character and located in some part of the upper respiratory tract, most often in the tonsils and teeth. Such infections may be chronic and long drawn out and caused by the viridans type of organism. Recently there has appeared in the literature by investigators working at Johns Hopkins, proof that the Streptococcus viridans give rise through its toxic product to an acute endocarditis and at the same time a hemorrhagic glomerulo-nephritis.

In answer to Dr. Douglas, I would say that in my experience animals have not shown any serious histological changes in the liver following the administration of streptococci or their toxic product.

Replying to Dr. Herold as to whether the toxin or the vaccine could account for the severe nephritis that developed in one of his cases. Certainly the toxic product in a vaccine prepared from the streptococcus could give rise to the nephritis in question since it has a predeliction for renal tissue. A vaccine prepared from the killed streptococcal culture when administered to a person induces primarily a lytic antibody which splits off from the streptococcal bodies a toxic principle. This toxic principle effects specifically the kidneys.

GASTRIC ACIDITY IN CONGESTIVE HEART FAILURE.

I. L. ROBBINS, M. D.,

NEW ORLEANS.

In congestive heart failure one is constantly impressed by the frequency with which gastric discomfort is noted. This discomfort is in large measure due to the marked distention of the stomach. It is well known that gastric distention and hyposecretion of the gastric juice, especially the acid, are frequently found to be coexistent. This fact suggested that a study be made to determine the gastric acidity in congestive heart failure.

For the purpose of this study fifty-one (51) consecutive cases of congestive heart failure admitted to medical service No. 6 at Charity Hospital were investigated. The symptoms presented in common were dyspnea, cough and pain. The signs were those of enlargement of the heart and liver with edema and ascites. Each patient was given an Ewald test meal and the contents aspirated at the end of one hour by

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means of a Jutte tube. Of this series of 51 cases, the youngest was fourteen and the oldest sixty-six years of age.

During the decade from 10 to 20 years, there was only 1 case. He had an achlorhydria.

During the decade from 20 to 30 years, there were 2 cases. One had a hypochlorhydria and 1 an achlorhydria.

During the decade from 30 to 40 years, there were 11 cases. One was normal; 3 had a hypochlorhydria and 7 an achlorhydria.

During the decade from 40 to 50 years, there were 15 cases. One was normal; 8 had a hypochlorhydria and 6 an achlorhydria.

During the decade from 50 to 60 years, there were 16 cases. One was normal; 3 had a hypochlorhydria and 12 an achlorhydria.

During the decade from 60 to 70 years, there were 6 cases. One had a hypochlorhydria and 5 an achlorhydria.

Of the 51 cases, 3 or 5.8 per cent were normal. Sixteen or 31.3 per cent showed a hypochlorhydria and 32 or 62.7 per cent showed an achlorhydria. From these tabulated results one is distinctly impressed with the fact that 48 or 94.1 per cent were below the accepted normal value for free hydrochloric acid. Of the 51 cases, 42 or 82.3 per cent occurred between the ages of 30 and 60 years. Of these cases there were 14 or 33.3 per cent who had a hypochlorhydria and 25 or 59.5 per cent who had an achlorhydria. Here again it is noted that 39 or 92.8 per cent were definitely below normal. It is of interest to note that the incidence of achlorhydria fell 23.6 per cent from the third to the fourth decade. From the fourth to the fifth decade there was a rise of 35.0 per cent. From the fifth to the sixth decade the achlorhydria again rose 8.3 per cent. For the hypochlorhydria there was a rise of 26.1 per cent from the third to the fourth decade and a drop of 34.6 per cent from the fourth to the fifth decade. From the fifth to the sixth decade there was a drop of 2.1 per cent. It will be noted in these fluctuations the subnormal values were the ones involved whereas the number of normal cases remained constant. The highest free hydrochloric acid reading in the hypochlorhydric cases was 13. One reading of 20, although somewhat lower than the accepted normal standard of comparison, was placed in the class of normal cases. The average reading was 7.4.

In the total acidity readings of the 51 cases, 19 were between 5 and 10; 11 between 10 and 20; 13 between 20 and 30; 3 between 30 and 40; 3 between 40 and 50; 1 between 50 and 60; 1 between 60 and 70. The lowest reading was 5 and the highest 68. Of the 51 cases, 47 were between 5 and 35, thus showing a marked lowering in 92.9 per cent of the cases. Add to this the higher but still subnormal values obtained in the series and we find 98.7 per cent of the cases definitely and decidedly lower than normal. The highest total acidity reading occurring in the cases of achlorhydria was 25.

The influence of syphilis on the gastric acidity was also observed. The Wassermann reaction was used as an indication of the presence or absence of the disease. Of the 32 cases of achlorhydria in the series, a Wassermann test was done upon 29. On 3 no record could be obtained. The Wassermann was positive in 11 and negative in 18 of the cases. Of the 16 cases of hypochlorhydria a Wassermann was done in 15. In 9 the test was positive and in 6 it was negative. One was not done. The combined figures for achlorhydria and hypochlorhydria showed that of the 47 cases, the Wassermann was positive in 20 and negative in 24. Of the 3 normal cases the Wassermann was positive in 2 and negative in 1. This shows that the factor of syphilitic infection was, most probably, of no great consequence.

In a study of this kind, one is beset by many difficulties. A search of the literature yields a scarcity of information, and most of that is to be found in the foreign literature. The value of the Ewald test meal and its limitations must be considered. The accepted values for free hydrochloric acid and total acidity vary greatly with the authority invoked. From a reference to several sources, the figures of 25 to 50 for free hydrochloric acid and 50 to 75 for the total acidity were accepted as standards for the comparison with results obtained in this work. The complexity of the task is further increased when one attempts to arrive at the normal incidence of achlorhydria and hypochlorhydria, in any given series in those apparently well in the general population. Black[1] quotes Evanston as having found 4 per cent of achlorhydria in normal university students. Dr. F. M. Johns in a personal communication presented me with the following figures. Forty-seven junior medical students were given an Ewald test meal. Gastric analysis revealed the following. Of the 47 analyses, there were 4 cases of achlorhydria, giving 8.5 per cent. There were 4 cases of hypochlorhydria in the series. Three of the cases were re-examined and given a histamine injection. They all responded with the presence of free hydrochloric acid. The fourth student refused to be re-examined.

At this point I wish to state that although I was not interested in studying the effect of histamine stimulation in this particular series, I nevertheless did 5 such tests. In all there had been no hydrochloric acid present following the Ewald test meal. Following the use of histamine, specimens collected for 1½ hours showed no free hydrochloric acid and no increase in the total acidity. I think it quite important to note that among these young and apparently normal medical students, the average free hydrochloric acid reading was 28.6. and the total acidity 59.1. The incidence of achlorhydria and hypochlorhydria at the various age intervals is of the utmost importance. All investigators are agreed that with the advance in years there is a definite decrease in gastric acidity. In a series of 300 cases reported by Black,[1] 65 per cent of the cases of achlorhydria were above 45 years of age. Seidline[1] found subacidity in 40 per cent of working people above 50 years of age, and in old persons about 65 years he found anacidity in 67 per cent. Friedenwald[2] in 112 cases of achlorhydria found the age distribution to be 16.9 per cent in the third decade; 29.4 per cent in the fourth decade; 31.2 per cent in the fifth decade. It is also of importance to note the frequency of occurrence of lowered gastric acidity values in general diseases, other than those gastric or cardiac in nature. Beck[3] states that in a series of 500 consecutive tests in general medical cases, he found free hydrochloric acid ranging from 0 to 20 in 25.4 per cent of the entire series and from 20 to 40 in 40 per cent. Black[1] found 300 or 10 per cent of achlorhydria cases in 3030 gastric analyses in general medical cases. He quotes Eggleston and Hurst as having found 10 per cent of achlorhydria in their cases. With these facts in mind one notes the findings in heart disease. Rhefuss[4] quotes and verifies Hoffman as stating that in chronic myocardial insufficiency there is an interference with the secretory output of the stomach resulting in subacidity and anacidity. Heufler[5] found no free hydrochloric acid in the largest percentage of cardiacs associated with valve lesions. Friendenwald[5] in 25 decompensated cases found normal free hydrochloric acid in 5; diminished in 13; absent in 6. In 25 compensated cases, he reported 17 with normal free hydrochloric acid; two with diminished and 2 with absent acid. Valzah and Nisbet in 23 decompensated cases found normal free hydrochloric acid in 5; diminished in 13 and absent in 5. In 18 compensated cases they found no change.

I found 3 or 5.8 per cent of normals in my series as compared to 5 or 20.0 per cent in Friedenwald's and 5 or 21.7 per cent of Valzah and Misbet's cases. In the cases with diminished acidity, I found 16 or 31.3 per cent of cases as compared with 6 or 24.0 per cent of Friedenwald's and 5 or 21.7 per cent of Valzah and Nisbet's. The subnormal cases of Friedenwald amounted to 76.0 per cent and those of Valzah and Nisbet to 78.2 per cent. In my series it amounted to 94.1.

With the possible exception of 3 or 4 cases, mucus was present in all specimen obtained. In only 3 cases was visible blood noted. The possible advantage of the use of free hydrochloric acid in these cases of congestive heart failure for the relief of abdominal discomfort and distention is noted en passant. In conclusion, I wish to express my thanks and appreciation to Dr. F. M. Johns and to the internes on our service at Charity Hospital for their help and co-operation in the performance of the tests.

CONCLUSION

The statistics of this study prove conclusively that in congestive heart failure there is a definite increase in the number of cases of achlorhydria and hypochlorhydria, which in this study amounted to a combined total of 94.1 per cent and a lowering of the total acidity, which amounted to 98.7 per cent.

REFERENCES

1. Black, D. R.: Achlorhydria, South. Med. Jour., 21: 920, 1928.

2. Friedenwald, J.: Osler's Modern Medicine, 3:359, 1926.

3. Beck, H. G.: Motor and secretory functions of the stomach, J. A. M. A., 91:1334, 1928.

4. Rhefuss, M. E.: Text book on diagnosis and treatment of diseases of stomach. (Edit., 1927.)

5. Friedenwald, J., and Morrison, T. H.: South. Med. Jour., 21:453, 1928.

DISCUSSION

Dr. J. Holmes Smith, Jr.: I believe that Dr. Robbins is serving a very good purpose in one way in bringing before us the subject of gastric conditions in heart disease. I do not believe the matter, while it is well known, has been sufficiently considered.

As for the question of gastric achylia in relation to heart failure, personally I am inclined to think that is what one would expect; with disturbance of the circulation and disorders of the gastro-intestinal tract naturally there is going to be some interference with the secretion of acid and the occurrence of various digestive symptoms.

As to the use of hydrochloric acid in the treatment of this condition, I have never given the matter any thought. We notice how rapidly, when our patient is treated with digitalis, the congestion ceases. I believe it would be interesting if Dr. Robbins would continue his investigation, repeating the examination when the period of decompensation is over, when the heart has compensated itself, and see what the gastric secretion is doing.

As stated before, this matter brought before us (the study of gastric symptoms in the presence of heart disease) is a very important one. Dr. Robbins has quoted Rehfuss to the effect that in the presence of congestion in heart conditions there is first of all an interference with the secretory output of the stomach due of course to the congestion. There are other things that go along with the heart failure, such as motor disturbance, alteration in bowel function, disturbance of kidney function, congestion of liver, etc., and I would like to suggest that Dr. Robbins continue his very interesting paper a little further and see what these patients are doing in practice when the heart is properly compensated.

Dr. I. L. Robbins (closing): In regard to these decompensation cases, or cases of congestive heart failure and what happens to the acid after they have become compensated. Our experience has been that in the cases that have lasted a long time, where the heart condition has continued over a period of several months, or the patient has had several attacks, they never get very much of a return of gastric acid; but in those cases that occur for the first time and are followed by compensation, we frequently find them producing a certain amount of hydrochloric acid—the amount, I am not at present in a position to state. The old chronic cases that lasted several weeks to a few months, or those that returned to the ward with a recurrence, did not seem to get a return of hydrochloric acid in the stomach contents.

OPHTHALMIC LIGHT THERAPY.*

By

CHAS. A. BAHN, M. D.,

NEW ORLEANS.

Light has been used at varying times in the treatment of disease since the days of Hippocrates. No serious study of its physiologic action or therapeutic possibilities was made however, until about twenty-five years ago when Finsen advocated its use in certain forms of tuberculosis. Photo-therapy has found another field of usefulness in the treatment of rickets, which is probably the fore-runner of numerous others.

The public and medical profession are at present rather deeply interested in this subject, which unfortunately creates a psychological time for the exploitation of equipment, a great part of which will do little good and some, in inexperienced hands may do actual harm.

From this varied experimentation however, good will probably directly or indirectly result.

The sense of vision is produced by retinal contact with wave lengths varying from 4,000 to 7,000 Angstrom units,† A. U., which compose the middle of about seven octaves constituting that form of energy called light. The longer wave lengths ranging from 7,000 to 20,000 A. U., are called infra red because they begin at the red end of the spectrum. They are increasingly and approximately equally obsorbed by both the cornea and the lens. The shorter wave lengths, which are called ultra violet, and range from 2,000 to 4,000 A. U., begin at the violet end of the spectrum and they are apparently somewhat more largely absorbed by the cornea.

Being intended primarily for the general physician as an abstract of progress in a new and interesting field, statements involving only technical accuracy have been avoided.

Unless excessive, visible light has practically no effect on the anterior eyeball, passing through its various media unobstructed. It is the obstruction of absorption of ultra violet or infra red light that causes an energy transference capable of therapeutic applications.

The longer wave lengths of infra red light upon contact with living tissue are generally speaking, transferred into heat and possibly have other effects with which we are not yet familiar. Following excessive, or too long exposure, cell death with coagulation, and accompanied by a vasodilatation and exudation, result.

Ultra violet light has quite a different effect on living tissues, though in excess also produces cell death. Sunburn is due essentially to ultra violet light and not to heat, forming a simple illustration of ultra violet therapy. Applied to the skin, it increases the activity especially of the epithelial cell life to a certain point beyond which degeneration begins; stimulates proliferation of pigment cells, the out-pouring of fluids from the capillaries, and the production of new chemical substances in the tissues. These are apparently involved in well being and the maintainence of a reasonable immunity to certain diseases. The fact that our blood is red, means that the red part of spectral light is reflected and the remainder largely absorbed. In this absorption of especially the short waves or ultra violet light, some find a simple explanation of a physiologic necessity of sufficient bodily exposure to sunlight which is rich in ultra violet lengths. Children obtaining insufficient bodily sunlight are more subject especially to rickets and phlyctenular disease and are often greatly improved when this deficiency is rectified. Adults require sufficient bodily sunlight probably almost as much as chil-

*Read before the Louisiana State Medical Society, New Orleans, April 9-11, 1929.

†The Angstrom unit, A. U., used in the measurement of light waves in 1/250,000,000 inch.

dren, and most of us who lead indoor lives would probably feel better if our entire bodies received at least an hour of sunlight daily. Because our faces and necks are tanned, we conclude that further light exposure to our bodies is unnecessary.

Bodily light baths are more generally used in Europe and will probably be more widely adopted by us. Sunlight unobstructed by glass is in my opinion, and apparently that of most authors, equal for general photo-therapy to any artificial light which has yet been made, and where available and practical, is in the large majority of cases, the more desirable. In this climate its application is extremely simple. The patient lies in the sunshine with as little clothing as possible, for approximately twenty minutes the first day and increasing five or ten minutes daily, alternating the other half of the body each second day until the skin has a slight tan, or until malaise, depression or other symptoms of overdosage result. A rest period of two weeks is taken and the process repeated if advisable. Especially in under nourished and under weight children where the organic disease offers no contra indications, light baths under the supervision of a physician often form an important auxilliary to other treatment. Diabetes, certain skin conditions, and idiocyncrasy are mentioned in literature as possible contra indications.

Ultra violet light produces in the cornea an increased life cycle of especially the epithelial cells, vaso-dilatation, the outpouring of fluids which have an altered destruction of superficial bacteria. The character, increased eosinophelia and the presence of certan analin stains such as fluorescein and congo red act as sensitizing agents materially increasing its bacterial effect. The latent period of about hours seen in electric conjunctivitis is apparently due to the premature death of the anterior corneal epithelial cells illustrating the effect of slight over dosage. In still greater amount, its action more closely resembles that of other forms of cauterization.

Based upon known physiologic action, the local use of ultra violet therapy most logically applied in the destruction of micro-organisms involving only the superficial layers, and in the stimulation or the slight cauterization of superficial tissue in the conpunctiva, sclera and cornea, with resulting increased immunity.

Ophthalmic literature records an occasional brilliant result following light treatment in all sorts of eye diseases which cannot yet be explained. These must be varified by intelligent experimentation before general adoption.

Infra red therapy is employed essentially as an analgesic in practically all inflammatory ocular painful affections, and if patents' statements are to be accepted, is apparently the most comforting form of heat applications used in ophthalmology. Its therapeutic value however, in the light of our present knowledge is practically nil.

The lamp that has been most frequently used in ophthalmic ultra violet therapy, is the irradiation lamp of Birch-Hirschfield, which has been employed in our series of 106 cases. Being of the arc type, both long and short wave lengths in profusion are transmitted, requiring filters which will absorb in a great part, all the wave lengths down to around 3,000 A. U. which are used for therapeutic purposes. The uviol glass filter transmits practically only light down to 3,150 and with an additional ½ per cent copper sulphate solution in a quartz cell, this is reduced to 2,800. With both filters the total amount of light transmitted is rather small and hardly sufficient for reasonably rapid therapeutic results. We have therefore used the uviol filter alone, which we think advisable. A container and lens system of quartz, or a special type of glass which will transmit ultra violet light is necessary, ordinary glass absorbing most of the short wave lengths.

We use an average five to ten minute exposure, the light condensed on the eye by an assistant if necessary. In but two of

our cases has the patient complained of slight discomfort following this treatment.

Among the other lamps used for ocular ultra violet therapy, the Kromayer lamp and that of Duke Elder both of which are mercury vapor arc lamps, are most frequently mentioned in the literature. The Curay, which is a mercury vapor incandescent lamp using a special form of glass globe which absorbs relatively less ultra violet light, is used by some Authors. In the next several years there will probably be marked improvements in our filtering system of light which will facilitate the use of specific wave lengths with greater ease and simplicity.

In our series of six patients treated with infra red light, we have used fifteen to thirty minutes with the Zoa light. The applications are given daily or as needed, the lamp being about two feet from the face, and the eye lids closed.

In the summary of our series of 106 cases treated by this method, the results given are based upon changes in subjective symptoms and objective symptoms compared with an imaginary similar case similarly treated except with light treatment omitted. No two eyes being exactly alike, it is rather difficult to evaluate with reasonable accuracy the effect that light treatment plays in the patient's improvement, especially as it was used only as an auxilliary in connection with more established treatment methods.

In affections of the lids, local phototherapy has been used apparently with

	Total	Much Improved	Improved	Not Improved
Supperative chalazion	1		1	
Hordeolum	4		4	
Blepharo-conjunctivitis	2		1	1
Trachoma	6		2	4
Keratitis, ulcerative, herpetiform	29	1	21	7
Keratitis, ulcerative re-current, traumatic	1			1
Keratitis, ulcerative, mariginal	2		2	
Keratitis, ulcerative, infected	3	2		1
Keratitis, ulcerative, infected, incipient following foreign body	17		14	3
Keratitis, interstitial	4			4
Corneal blood stain	2			2
Corneal opacities superficial and deep	3		2	1
Episcleritis	4			4
Scleral wound perforating with beginning infection	1		1	
Irido-cyclitis (varying types, stages and causes)	9		5	4
Glaucoma, primary	5		1	4
Miscellaneous including: Secondary retinal detachment, acute and chronic conjunctivitis, neclear and cortical lens opacities	13		6	7
	106	8	60	43

Summary of 106 ultra violet treatments.

benefit in herpetic and tuberculous disease, eczematous affections, chalazia, hordeola and as a preventative of infection extension following injury.

In the conjunctiva it has been more frequently used in blepharo-conjunctivitis, trachoma, vernal conjunctivitis, and phlyctenular disease, especially involving the limbus.

In affections of the sclera, especially of tuberculous origin, ultra violet therapy seems to be regarded as a valuable adjunct to other treatment.

In the herpetiform group of corneal affections characterized by variable loss of substance, delayed healing, diminished sensitiveness and negative explanatory bacterial findings and especially in the incipient stages, this form of therapy appearently finds its most successful application. The use of a properly prepared 2 per cent fluorescein or 1 per cent congo red solution apparently accentuates the intensity of its effect. Based upon our experience I would unquestionably desire this form of therapy used upon me, especially if I had herpetic disease or beginning serpigenous ulcer.

In pneumococcal ulcers, I do not believe that we are justified in omitting any or all of the other methods of treatment at our command which might hasten recovery, simply because ultra violet therapy is being used. In other words, I think that ultra violet therapy is only an adjunct to other treatment.

In the dystrophic group of corneal affections, photo-therapy also finds a logical application and has been recorded in the literture rather favorably in the treatment of these otherwise progressive conditions. The phlyctenular group of corneal affections apparently offer a more fertile field for general than local photo-therapy, which however, is worthy of trial.

In affections of the lens, excessive dosage far beyond that used for ordinary therapeutic purposes is capable of producing opacities of various sorts. The amount of ultra violet light necessary to produce lens opacities in human beings apparently varies widely, but only far in excess of any reasonable therapeutic application.

Infra red light however, can produce lens opacities rapidly, if excessively used both in man as is illustrated in glass blowers, and in animals as is repeatedly artificially produced in the laboratory. Whether or not either can be practically used in the artificial ripening of lens opacities is worthy of investigation. In the prevention of lens opacities however, neither infra red nor ultra violet light has any sound reason for being used.

The application of ultra violet therapy to the posterior eye varies greatly from the anterior half because of light absorption through the cornea and lens. With our present equipment, so little ultra violet light, reaches the posterior eye after therapeutic dosages, that its use hardly seems worthy even of experimental trial. Some method of overcoming these difficulties will probably be devised in the near future.

In the fundus, light in excess of that which can be used by the choroid for visual purposes, is probably transformed into heat. The blindness produced by viewing eclipses or other intense light is apparently due to the condensation of an enormous amount of visible light producing an ordinary heat burn.

I am especially indebted to Dr. S. R. Gifford for use of slides and for the many ideas obtained from his excellent work, which with that of Birch-Hirschfield and Duke Elder, largely record our progress in ophthalmic photo-therapy to this time.

CONCLUSIONS.

1. Bodily light baths under reasonable supervision are an important adjunct to other treatment in numerous bodily diseases which directly or indirectly affect the eye and are especially indicated in children with deficiency of bodily development and

nutrition. They are also of value in adults leading in-door lives, receiving insufficient sunlight, and showing excessive fatigue or other evidence of bodily disfunction.

2. Sunlight for this purpose is at least the equal in therapeutic value of any artificial light yet devised and generally speaking is preferable.

3. Ultra violet light in therapeutic doses apparently increases cell activity, stimulates pigment formation, destroys bacteria, increases lymphatic circulation, and produces substances which increase bodily immunity.

4. Ultra violet ocular therapy is a valuable adjunct to other treatment, especially in certain types of superficial diseases involving infection or delayed cell reproduction and recovery, such as the herpetiform affections and dystrophies.

5. The most promising field for ultra violet ocular therapy apparently lies in the prevention or arrest of infected ulcers and herpes and in its early use following injuries showing the first signs of delayed healing.

6 The use of analin dyes in ulcerative affections and powered dionin in non-ulcerative affections immediaely prior to ultra violet treatment, apparently markedly accentuate its therapeutic effect.

7. Especially in pneumoccocca corneal ulcers, light treatment alone cannot be depended upon sufficiently to justify its exclusive use, but should be used with other treatments.

8. The Birch-Hirschfield irradiation apparatus has proved satisfactory used with uviol filter alone.

9. Infra red ocular therapy is we believe, the most pleasant form of heat application and is an excellent analgesic in all painful and inflammatory ocular affections.

DISCUSSION.

Alva G. Thomas (New Orleans): I have observed and treated with the author many of the cases mentioned and in general concur in his conclusions.

In the treatment of varying types of painful, inflammatory affections, especially corneal ulcers, irido-cyclitis and certain traumatic conditions, the use of infra red therapy convinces me that it has considerable merit in ocular therapy. It is a valuable aid for the relief of ocular pain. Let us not forget that the relief of pain is an important step toward general well being, which indirectly exerts a powerful influence in ocular recovery, irrespective of cause.

I have been interested in the application of ultra violet light especially in cases of herpetiform keratitis. In the prevention and arrest of this and other corneal infections, is apparently the field of greatest usefulness for local ultra violet therapy.

Especially in cases of herpetic affections it is sometimes difficult to judge the effect of any therapeutic measure because of the great variation of intensity in the sometimes multiple causative factors. We can estimate only roughly the degree of involvement and injury of the trophic innervation of the cornea by the objective findings, and by the general constitutional reactions of infection, or poisoning.

The healing of the corneal affection may be prolonged, due to our failure to locate the dominant causes or to the patient's reluctance in undergoing the necessary surgical treatment. This occurred in two of our cases where roentgen-ray revealed dental infection. Only upon removal of the infected teeth, did healing readily occur.

The effect of mental disturbance and nervous shock as provoked, for example, by any misfortune in life may aggravate ocular affections of this sort, as shown in two of our recent cases.

The general well being of the patient including living habits, diet, rest, and exercise, the abuse of especially tobacco, must also be considered in the evaluation of any ocular therapeutic measure.

In a recent case with extensive detachment of the corneal epithelium, after remaining unchanged for two months, the entire affected epithelium was removed surgically and within forty-eight hours was completely replaced. I find that Dr. S. R. Gifford mentions two similar cases in which ultra violet therapy was ineffective, his final treatment being abrasion and bandage.

On the whole I believe that general and local light therapy is a most useful adjunct to other treatment in ophthalmology and will find an increasing field of application.

BIBLIOGRAPHY.

Only the most important contributions on this subject are intentionally mentioned. These contain a complete record of the literature and are:

1. S. R. Gifford. Light therapy in ophthalmology. American Academy of Ophthalmology, pp. 195, 1928.

2. Birch-Hirschfeld u. Hoffmann. Die Lichtbehandlung in der Augenheilkunde, 1928.

3. Duke-Elder. Brit. J. Ophth. 11:67, 1927; 12:189 and 353, 1928.

4. Duke-Elder. Recent Advances in Ophthalmology. 1927.

INDUSTRIAL MEDICINE.*

JAS. M. ADAMS, M. D.,

Baton Rouge, La.

While the spectre of "state medicine" haunts our profession and organized medicine concerns itself with medical service by lay organizations, contract practice and other deviations from the established form of private practice, it seems pertinent to define the aim and scope of industrial medicine. Some of their problems have been presented to you by industrial surgeons, but there has been no discussion here of the physician in industry.

Since the passing of the guilds there have been sporadic experiments by employers in furnishing medical service to their employees. In 1817 an English traveler in Ireland wrote of a woolen mill at Kilkenny, Ireland, that "to prove against or to remedy sickness or bodily injury from accident, the services of an eminent physician or surgeon are engaged; and an appropriate infirmary is about to be built on an appropriate and healthy situation." But it took the world war with the necessity for high speed production and the shortage of labor to emphasize the importance of conservation of manpower, and it is only within the past fifteen years that Industrial Medicine has reached its present development.

*Read before the Louisiana State Medical Society, New Orleans, April 9-11, 1929.

NEED

The Modern Hospital asks, "Who is responsible for the health of the worker in industry—the state, the employee or the employer?" The socialist answers that it is the duty of the state; the individualist that the employee must care for himself; but there is a noticeable tendency for industry itself to shoulder the burden. The state made the first move with the passage of workmen's compensation laws, and is continuing to make laws relative to the preservation of the worker's health. But employers with vision and corporations with souls have gone far beyond the demands of the state. It matters not that compensation laws may have been the guiding hands that pointed the way. Industry has realized the benefits to employer, employee and the community and is daily increasing the scope of its preventive work, until today industrial medicine is a power in health preservation and life extension. The time is coming when state medicine may be forestalled by efficient plant medicine.

A few years ago three-fourths of the population of our country were engaged in agriculture with large industries confined to a small area. Today factories are scattered throughout the country and three-fourths of the population are engaged in industry with a constant trend of the population to urban centers. This grouping of individuals gives industry an exceptional opportunity for preventive work. Industrial workers have the same health problems as those engaged in other pursuits, but they have additional risks. Industrial medicine is not intended to supplant, but to supplement public health work. Present day industrial methods with high speed machinery and quantity production require working under stress and pressure. Larger units increase crowding. New methods utilizing chemical compounds which have deleterious effects on the worker are being frequently introduced in manufacturing processes.

The cost of sickness to industry is tremendous. An average of five per cent of the workers are sick at all times, with an average of nine days per year lost for each workman. Cheney Bros. estimate the cost of sickness to the employer at $60.00 per year for each employee.

Restriction of immigration threatens to cause a shortage of labor and emphasizes the necessity for conserving our labor supply. The day of the hobo workman is passing. Prolonging the lives and usefulness of old and experienced employees is more important to the employer than saving time lost. A study by the Metropolitan Life Insurance Company shows that the death rates for white males engaged in industry in each age group from twenty-five to sixty-four are 25 per cent higher than in the corresponding groups in the U. S. registration area.

Ordinarily 25 per cent of the employees are reached by the industrial medical department each month. In the industry I serve, we render medical service to every employee an average of once each month.

AIM

The American Association of Industrial Physicians and Surgeons has resolved that "It is not the reasonable and proper responsibility of an industrial physician to treat cases of a serious or incapacitating illness of non-industrial origin except under unusual circumstances. Minor disabilities of non-industrial origin, if not incapacitating, may well be treated at the plant dispensary." Let me emphasize that industrial medicine does not contemplate the treatment of disabling illness. It is true that some employers do furnish complete medical and surgical service to their employees, but the principle is paternalistic and therefore industrially unsound. It is a proper function of industry only where adequate medical service is not otherwise available. When included in industrial medical service it is usually at the expense of the true mission of industdial medicine.

The aim of industry is production and the work of the medical department, as of all other departments, is to that end. Its contribution to increased production is the yardstick by which its success is measured. But industry today has so much concern with the welfare of the worker that medical service, which is the basis of all welfare work, has other justification for its existence. It has a humanitarian as well as an economic duty and must not be commercialized. To accomplish its purpose it seeks to reduce the loss of time from work arising from sickness and accidental injury by prevention and by shortening the disability period; to increase the efficiency of the worker and add to his contentment by improving his health; to prolong the life and usefulness of old and experienced employees; and by these measures to reduce the cost of employing and training new and inexperienced workers. The amount of disability from sickness in industry is ten times greater than from accidents, so the prevention of illness is the major problem of the industrial physician.

SCOPE

The functions of the plant medical department are medical, surgical, hygienic and sanitary. The medical service contemplates the treatment of minor and incipient disease and co-operation with the physician attending those seriously ill.

Good operative surgery represents only one-fourth of what may be considered as adequate industrial accident service. Of equal importance are the prevention of accidents, efficient first-aid treatment and the after care of the patient. Prevention of accidents must always be a medical duty even where a safety department operates independently of the medical department, and the industrial physician must be familiar with the accident hazards in his plant. Thirty-five per cent of all accidents in industry are due to physical defects in employees, such as defective eye-sight, hypertension, heart disease, and epilepsy, and these predisposing causes can be elim-

inated by correction of defects and placement in suitable employment. The importance of efficient first-aid to the injured needs no emphasis. Surgical treatment is not complete until the patient attains the maximum restoration of function, is re-educated and placed in suitable employment.

Hygienic measures are aimed at the early recognition and prevention of diseases, education in health preservation, and maintenance of a healthful working environment.

Sanitary conditions must be maintained in lunch rooms, work rooms, toilets and wash rooms and good housekeeping methods insisted upon.

The work of the industrial medical department may be divided into treatments, physical examinations, laboratory examinations, dental service, visiting service, inspections, educational measures, transportation, record keeping, administrative duties and consultation service.

First-aid treatment of accidental injuries was the original purpose of the plant physician. Selective treatment of minor injuries and ambulatory cases is given. Confining injuries and those requiring surgery should be treated by an industrial surgeon. Physical and other therapy should be administered to restore function after injuries, and all permanent disabilities must be followed up until the maximum of improvement has been secured.

Medical treatment is given for minor illness and home injuries, for medical emergencies and for occupational diseases. Employees are urged to visit the plant dispensary freely. Early manifestations of serious diseases are recognized and the proper means for their prevention instituted. The patients treated are those that would otherwise usually treat themselves, often with patent medicines, but with the services of a physician available this harmful practice is discouraged. Medical first-aid is as important as surgical. Occasionally it may be necessary to treat certain diseases. In the industry I serve we have found it advisable to treat employees having malaria in order to eliminate the carriers and thereby reduce the malaria incidence. Many employers, realizing that it is impossible for the average workman to finance the proper treatment of tuberculosis, are furnishing their tuberculous employees with sanatorium treatment in recognized institutions.

Each applicant for employment should have a physical examination. Employees are protected thereby from exposure to infectious diseases from which the applicant might be suffering; the applicant is prevented from engaging in work for which he is not physically qualified; and the industry is protected from false compensation claims for a previously existing disability.

Periodic health examinations reveal numerous defects which may be corrected with a consequent improvement in health and prolongation of life. Disabilities are found which make the usual occupation of the employee a menace to his health and by changing his work the danger is removed. Transfers of men from one kind of work to another should first have the approval of the physician. Men returning to work from absence due to illness or injury must be examined to determine their fitness to resume work. Those exposed to or engaged in handling industrial poisons must be examined frequently to detect early symptoms of intoxication. Food handlers require frequent examination for communicable diseases.

The importance of focal infections makes the service of a dentist indispenable. He examines applicants for employment, makes periodic examinations of the employees, gives prophylactic and emergency treatments, gives advice for permanent treatment and follows up the cases to see that defects are corrected, reports on patients referred by the physician and treats industrial dental injuries.

A clinical laboratory should be maintained for use in physical examinations, for diagnosis and for the early detection of poisoning. A roentgen-ray laboratory is a necessity in treating injuries and an invaluable aid in diagnosis.

There is no activity of the plant medical department that does more to promote a spirit of loyalty to the employer than the service of the visiting nurse. All sickness is accidental, and most families are ignorant of even the simplest measures for the comfort and relief of the patient. Every employee absent on account of sickness should be visited at once by the nurse. If th services of a physician are necessary, she advises that one be called. She instructs the wife or mother in the rudiments of nursing and in the measues necessary for the protection of the other members of the family. She has a wonderful opportunity for imparting health information and should miss no chance to correct any unhygienic condition found in the home. Her influence is doubled if her service is extended to the families of employees. She must never be used as a detective to trap malingerers.

Frequent inspections are necessary to maintain sanitary conditions in toilets and wash rooms. The effect of clean quarters reaches back to the home, for the employee who becomes used to cleanly facilities will provide them in his home. Close supervision should be maintained over the lunch rooms including examination of the food handlers, sanitary methods and selection and preparation of food. The services of a dietitian are desirable.

Proper ventilation of work rooms is an important preventive measure. Seating and lighting arrangements have an influence on fatigue and efficiency. Dust and industrial poison hazards must be reduced and the employees exposed to such hazards protected. The water supply must be guarded. Good housekeeping is an important and safety factor.

Education of the employee begins with his physical examination. He is instructed in the correction of defects. He is told to report early to the dispensary in case of illness or injury. When he does come, he is in a receptive mood, and a word from the nurse or the doctor on prevention is seed sown in fertile ground. The visiting nurse sees him in his home and gives him another message. Simple articles on health subjects should be used in the plant paper. Bulletins and moving pictures have their appeal. Employee organizations may be utilized to disseminate information. Training in first aid is a factor in the prevention of accidents, a means of saving life, suffering and added injury both in the plant and out, and is an asset to the community. Recreation and athletic actitivities should be encouraged and directed, and employee welfare organizations should be actively supported.

Where the plant covers a large area, means of quick transportation should be provided from the scene of an accident to the dispensary, and an ambulance should be maintained to carry the severely injured to the hospital. Prompt handling and transportation of an injured employee create a feeling of security in the worker and increase his confidence in the medical department. The ambulance is also used to transport men becoming acutely ill while at work.

Records are as important to the industrial physician as they are to a hospital. Every treatment and every contact with an employee, even of the most trivial nature, should be recorded. A fairly accurate measure of an employee's physical status is presented in records of the physical examinations, treatments of injuries, minor diseases and details of disabling illness covering the period of his service. Often trivial injuries, non-industrial injuries or illness are bases of claims for compensation and accurate records safeguard the employer.

Administrative duties take up a large part of the industrial physician's time. He must direct the personnel of the medical department which in a plant employing several thousand workmen will consist of one or more physicians, a dentist, one or more visiting nurses, a hospital nurse with the necessary number of assistants, a roentgen-ray, laboratory and physio-therapy technician, one or more clerks, a sanitary squad and a varying number of consultants. The department must be operated as economically as is consistent with efficiency. The fact that an industry is capitalized for millions of dollars is no excuse for extravagance. Close contact and cooperation must be maintained with all departments, especially the employment and personnel departments. The administration of employee organizations such as benefit societies call for his assistance. Some industries provide insurance for their employees, which adds to the administrative duties.

Like the general practitioner the industrial physician must have knowledge of all the manifestations of diseases, but like the general practitioner he can not be a specialist in all branches. So he should have a number of consultants on his staff varying with the needs of his industry. Unless he does his own surgery, an industrial surgeon is a necessity. The services of a consulting opthalmologist should be available for the treatment of severe eye injuries, for determination of visual defects and for prescribing glasses. Many a mediocre workman has been transformed into a valued employee by being fitted with glasses. If much roentgen-ray work is done, a consulting roentgenologist is desirable. There are many workers of sub-standard mentality or with emotional disorders that need the help of a psychiatrist. By advice, job selection and correction of environmental obstacles, the value of many of such men to the industry is increased, and sources of labor troubles are eliminated.

The industrial physician must himself serve as consultant in diagnosis to any sick employee and when requested assist in or be present at operations on employees or members of their families. If the worker has confidence in the industrial physician he will go to work in a more cheerful frame of mind if he knows the physician is present at an operation on one of his family.

The medical department described is suitable for industries with several thousand employees. The same service can and should be furnished to even the smallest plants. This is being done in many places by industrial clinics organized along the same lines but serving many instead of one industry.

QUALIFICATIONS NECESSARY FOR THE INDUSTRIAL PHYSICIAN.

The Conference Board of Physicians in Industry has defined the industrial physician as "one who applies the principles of modern medicine and surgery to the industrial worker, sick or well, supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation and accident prevention: and who in addition has an adequate and cooperative appreciation of the social, economic and administrative problems and responsibilities of industry and its relation to society." He must be well grounded in the fundamentals of medicine and surgery, and should have the background of experience in general practice so necessary for the specialist in any line. He must have executive and administrative ability, as his authority should be equal to that of the superintendent of a department. It is advantageous to have all personnel work including employment, safety, insurance, compensation and medical in one department headed by the physician, with authority to make decisions subject only to the approval of the head of the industry. The welfare of the employees should be his constant aim and he should be qualified to take a leading part in their activities. He must inspire confidence in the workmen and hold the confidence of the

foremen, superintendents and officials. He must be unprejudiced and impartial and be able to plead the worker's cause when he is right, and to give him the benefit of any reasonable doubt. He can best serve his organization by having the best interests of the employee foremost in his thoughts.

He must have initiative and vision. Doing only the work that comes to his hand will not be enough. He must find work for his hand to do. A knowledge of the social and economic condition of the employee is essential in improving his health and efficiency. He must know the plant and the personnel. He must be an educator, for education is his strongest weapon. His relations with the employees should be as strictly confidential as if they were private patients, and his reports on their physical condition should be in general terms and should not include diagnoses.

RELATIONS WITH THE PRIVATE PRACTITIONER.

The industrial physician should be a member of and take an active part in his local medical society. If he is to be successful it is necessary that he have the good will, respect and confidence of his professional associates. He should maintain at least an associate membership on the staff of one or more hospitals. In contrast to other specialists, he refers cases to the general practitioner or to specialists instead of having cases referred to him. His activities increase the work of his professional associates in the same way that public health work should. Patients are referred by him for disabilities of which they are ignorant, and many taking home remedies or patent medicines are advised to consult their doctor. Having the advice of a physician available encourages the employee to consult his physician earlier and more often for the members of his family.

He must carefully observe the professional amenities. In referring cases to specialists he should name several rather than one man. Delicate situations arise which require tactful handling when he does not agree with the attending physician in the treatment of a patient.

ACCOMPLISHMENTS.

The industrial medical department has reduced absenteeism from sickness and injury twenty-five to fifty per cent. The National Cash Register Company, with a competent health service, has a sick rate of one and one-half days, per employee per year against an average for the country of nine days per year.

Infections from injuries have been practically eliminated. Permanent disabilities from injury have been greatly reduced. Premiums for compensation insurance and the cost of compensaton have been lowered. The employer has been saved from false claims for compensation.

Unhealthful working conditions and neglect of injured workmen have been eliminated as causes for strikes. A better feeling of the employee for the employer has been engendered, with a consequent increase in efficiency.

Preservation of the health and prolonging the lives of workers have been accomplished. The discovery and correction of a serious defect in a single executive may be worth much more than the total cost of the medical service.

Labor turnover, which has been estimated to cost $35.00 for each new employee, has been reduced to a minimum. Much time has been saved by dressing injuries and treating minor illness at the plant which would otherwise necessitate absence from work for their treatment.

OPPORTUNITIES FOR STUDIES.

Opportunities for research are limited only by the time that may be given to them. The following are a few studies suggested by the work of our medical department: a comparison of blood pressures in white and colored males, the cure of malaria, the prevalence of syphilis as shown by the Butler precipitation test in apparently healthy

negro males, the prophylaxis of respiratory diseases with vaccines, a routine treatment for aborting "colds", the influence of working conditions in the etiology of "colds", the alkaline ash diet for hypertension and causes of low back pain.

An industrial medical department will have records of many complete examinations of apparently healthy individuals, morbidity statistics of its group of employees covering the period of their employment, and much other statistical data not available elsewhere.

Relief of suffering, saving of lives, the discovery of new methods for combating illness are the doctor's compensation. No less satisfying are the prevention of disease and the extension of human life, which are the rewards of the industrial physician. The practice of industrial medicine is worthy of the best talent in our profession.

REFERENCES.

Hackett: Health Maintenance in Industry. A. W. Shaw Co.

Clark: Health Service in Industry. The McMillan Co.

Mock: Industry Medicine and Surgery. W. B. Saunders Co.

DISCUSSION

Dr. W. Alvin Love (New Orleans): I am sure Dr. Adams has contributed something which well belongs in the archives of this anniversary, and he is sounding a note for considering something that has to be eventually about as sweeping as the Workmen's Compensation Act is today.

Medical men are always poor advertisers. That is why the surgeons get the big fees and medical men get the small ones.

The workman has been taken care of from the standpoint of his injuries. The question as to what should be done with his occupational illnesses has not been settled yet except in such plants as employ industrial physicians. The courts have ruled that industrial illnesses have no place in the Workmen's Compensation Act.

It is only a question of time until the plants, not only big ones but small ones, are going to realize the necessity of doing what Dr. Adams' plant is doing for their workmen, and the only thing we have to worry ourselves about is whether this thing shall be handled by the plants and their physicians, or whether it will be taken up by the bugbear of state medicine.

I want to say that I received a bit of valuable information from the recountal, just how to go about these things. While just a few of us have the opportunity to put these into effect, it shows us that there is a distinct relationship between an industrial physician as a specialist and general practitioner. I believe Dr. Adams has sounded one point which men doing contract work should remember; that the contract physician or the contract surgeon owes a certain consideration to men in general practice, and that he should be considered as a man who is sending cases to the general practitioner rather than the man who is taking cases away from the general practitioner.

Dr. T. J. Perkins (Jackson): I am familiar with the work Dr. Adams has done, and I should like to know if there has been any attempt to evaluate the mental capacity of men that come into their employ to do certain types of work.

It occurs to me that it would be very valuable to any industrial plant that employs a very great many men to have an environmental test to learn what his social, educational and industrial opportunities have been, and what he has done with the opportunities he has had. I believe a test of that sort would be invaluable to the large industrial plants because they are apt to place men here and there, and their mental qualifications might not be fitted to the position they hold. I should like to ask Dr. Adams if they have ever taken up that branch of the subject?

Dr. Adams, Baton Rouge (closing): I have nothing to add except in reply to Dr. Perkins' question with regard to the mental classification of the men on the job.

We are only doing that in a limited way, and in the way that the general practitioner practices psychology. As I mentioned in my paper, I think the services of a psychiatrist are very important in the proper conduct of industrial work.

THE RELATIONSHIP OF FEEBLEMINDEDNESS TO CRIMINALITY.

H. R. UNSWORTH, M. D.,

NEW ORLEANS.

Feeblemindedness is a condition characterized by the lack of normal development of the intelligence, resulting from either injuries received before birth, at birth, or during the first six years of life, or from the imperfect development of the brain structures. Feeblemindedness, therefore, always appears in early childhood.

The Louisiana State Board of Health, of which Dr. Jos. O'Hara is the President, has very recently declared its interest in the feebleminded child by establishing a department of Mental Hygiene, of which I am Director. It is our hope to justify the existence of this very necessary adjunct to public health work, and to assist in identifying, classifying, and handling the cases of feeblemindedness throughout the State of Louisiana, and thereby not only correcting the waste in human derelicts but also to prevent the tremendous economical burden thereby encumbent on the State. This can be done by the prevention of crimes that are by far a part and parcel of all expressed deficient mentality.

There is no question but what many cases of feeblemindedness go unrecognized, and it is only after an atrocious crime that the question of a criminal's mental status is sought. This not only creates disrespect for expert testimony, but it also works an injustice both to the legal procedure, the criminal, and the victim of such a situation. It is our hope to recognize these early, so that the criminalistic tendencies of these people be directed into more useful fields industrially speaking.

The more I see of habitual criminals and murders, the more profound I feel that the vast majority are unfortunates, who are stamped with decided physical and mental stigmata of various degrees of feeblemindedness; though, I admit there are certain emotional reactions in normal individuals that end in criminal deeds. I, however, believe that as we go along in our studies of the criminal, we will find that we need larger and a greater number of psychopathic hospitals instead of immense prisons. It might be surprising to some of you to know that in many instances an individual of retarded mental development bears no physical evidence of his psychic contents, and again it is surprising to find there are certain types of feebleminded individuals who have essentially a normal intellect as revealed by the recent intelligence test, but who are moral and social imbeciles.

There are three types of mental developments: the intelligent, the social, and the mechanical. It is easy to recognize the vast possibility of misjudging an individual from the viewpoint of his academic knowledge only, and neglecting to ascertain the social reactions, for it is the anti-social type of feeblemindedness that fills the ranks of criminals.

I wish to convey to this body that a feebleminded person is not necessarily a criminal, nor likely to be, it depends tremendously on the extent of his social feeblemindedness, so to speak.

The constructive part of this program as undertaken by the Louisiana State Board of Health is, first, to be sure that an individual is feebleminded. I have found in many instances that where a child was backward in school, with reports of minor misbehavior reactions that he was considered feebleminded, but on examination was found to be a victim of organic nervous disease. It is easy to understand that when we have a retarded mental development, due to a definite organic change, it is possible in numerous instances to correct this defect, and re-establish the child in normal life. Secondly, to understand from the beginning that if a child is feebleminded though he has shown no gross or

*Read before the Louisiana State Medical Society, New Orleans, April 9-11, 1929.

major misbehavior, that he may be adjusted to some minor industrial occupation, which would not only serve as a very definite constructive program, but would make the patient self-supporting. Thirdly, if the outstanding feature is that of anti-socialism, criminalistic tendencies or expressions, they should immediately place that child under the protection of an institution. This automatically prevents any possible act of violence, with the incurrance of the expense of legal procedure to the state, and finally, the recognition that the individual has always been a mentally defective person and therefore not responsible for his acts.

Long before a method of mental measurement by tests was discovered, an English commission, after studying the problems of feeblemindedness, defined a feebleminded person as one who on account of mental defect occurring at, or near birth, is incapable of competing on equal terms with his fellows in the station of life to which he is born. It is evident from the above definition, that failure in social adjustment was a determining factor as to feeblemindedness. Of recent years, there have been developed standard tests for measuring the degree of intelligence of individuals of all mental levels; and those falling below 75 I. Q. are automatically classed as feebleminded. This appears to rather lessen the significance of social maladjustment, which after all, is the outstanding characteristic of the criminally inclined feebleminded individuals. It is my opinion that it is this type of person the law, both legally and economically, is interested in, for the fact that acts committed by this type of persons rock the social structure under which a normal community exists, thereby jeopardizing the security of individuals and states.

The first anti-social act of a juvenile personality often seems so mild as to appear none other than a problem of misbehavior, and appears on the surface to be an insignificant response to bad environment. But as a rule if a thorough investigation is made both from the social and mental viewpoint it will be found that the child is a feebleminded problem.

I contend that normal misbehavior is differentiated from pathological behavior by the simple fact that, if a child is properly corrected for its anti-social reactions, it will soon correct these. On the other hand, if the misbehavior is repeated in spite of the fact that punishment has been intelligently administered the result of profound study usually reveals a substantial mentality. It is from this point of view that I take issue with the behaviorist and the psychologist, for the simple fact, that their attempts at correction usually necessitate prolonged observation and give too much time for the development of fixed behavior reactions, also opportunity for some criminal deed to be done before the child is recognized as a case of feeblemindedness.

I feel that the efforts of our State should be confined to the definitely abnormal child, and not to the mal-adjusted social patient, who has a normal mentality and is merely a victim of environment and poor parental supervision. I further believe that a necessary requisite of social clinics, dealing with children in their formative years, whose acts and reactions are more or less automatic should be to have directors and persons of authority informed along lines of normal and abnormal behavior as well as biologists and physicians and whenever possible parents.

Though I am unable to quote any reliable statistics regarding the relationship between the population of penal institutes and the number of feebleminded persons in them, yet, it has been my observation that the constant offenders of persons and property, are usually of the psycopathic type. This is a particularly broad and indefinable classification, for the reason that many of these people cannot be definitely considered feebleminded, as revealed by our standard intelligence tests. However, a detailed

social history will usually reveal a definite pathological behavior pattern from infancy, and this is the type to which I refer as the socially feebleminded. In going through the case histories at St. Elizabeth's Hospital for the Insane, I find in the Howard Hall Service, which is for the criminally insane, that the early behavior problems are a striking feature, and the physical stigmata of degeneracy is obvious in most instances.

In concluding this paper, though not accurate from a statistical viewpoint, I feel I have directed your attention to the unmistakable recognition of the substandard mentality and its relation to crime.

Note: The mental age reveals how intelligent a defective child is at the time of examination. The intelligence quotient tells how bright he is compared to a normal child and how intelligent he will be when he reaches the age of fifteen or the adult level.

The modern psychometric test classifies morons as those having an I. Q. between fifty and seventy, and as imbeciles between twenty-five and forty-nine, idiots less than twenty-five.

DISCUSSION.

Dr. J. A. O'Hara (New Orleans): It has been my privilege at a meeting held during this medical congress to discuss "Preventive Medicine" in its relation to infectious and contagious diseases. I am thankful to you for the advantage again to "champion" the cause of preventive medicine from an entire and independent subject, The Prevention of Delinquency and Criminality by Psychiatry.

It is absurd for us to assume that mental disturbances must confine itself to definite pathological changes in the individual brain, as we have been led to believe in considering the feebleminded or insane, so, in discussing the relation of *prevention* (I like this word because it is the Aladdin's lamp that brightens the pathway for longevity to our descendants), so, again, in discussing the relation of psychiatry to prevention of delinquency and criminality, your special attention is called to subjects that you have on many occasions overlooked, unless you are fortunately a close observer of all mental and physical reactions.

Your attention please: All human beings are sometimes in serious conflicts with the laws and order of the community in which they live, and this is due to some passive mental disturbance in the cortical area. This inadequacy is generally of a minor sort and easily corrected by experience and time. We have with us in this group:

First, those individuals whose habits and behavior responses are far below their true mental reactions.

Second, those individuals whose actual mental capacity is below the level of adequacy.

The delinquent and criminal are those that fall below the lower level of adequacy of the second group. The problems of the first group are, then, one that by education, training and by strengthening the weaker points in their development, and by education of saner behavior and habits response, and bring them up to their full mental capacity.

For it is through this effective training that examples of reform and improvement have been observed, when they are properly combined with efforts of academic teaching which may be associated with psychiatry training under proper guidance. It was with this object in view that the Louisiana State Board of Health became interested in one of its new projects—the creation of the Mental Hygiene Clinic.

Dr. C. S. Holbrook(New Orleans): I am in accord with everything that Dr. Unsworth has said in his paper with possibly one or two exceptions.

The main value of studying children is due to the fact that school time is the golden period for mental hygiene. That is the time when children who are defective, or who are anti-social in any way, can be brought to the notice and study of the psychiatrists. The children who are definitely feebleminded, and I think that is the type Dr. Unsworth had in mind primarily, can be discovered and segregated.

These children who cannot compete with the normal child should not be forced to make the effort to do so for failure and discouragement are bound to result. When the child is found to be mentally deficient steps can be taken whereby he can be placed in an invironment which will be more congenial. If forced to do the things he is unable to do he will quickly drift into habits that are anti-social, or he will become a truant from school. From there he will enter into petty thefts, and from there the crimes will be of a higher order as his years multiply. We have a Municipal Home for Boys here, and a large number of children are sent there because of delin-

quencies which are the result of mental defectiveness. Often they are not inherently bad, but are unable to get along, so they drift into deliquencies. Recognizing these children early will make it possible to prevent crime of a more serious nature later on.

There are some children, however, who develop conduct disorders who are not feebleminded. It is my feeling that these children are very hopeful because their reactions can be modified; they can be saved and taught the more proper way of living.

The feebleminded child cannot be "cured" or made of average intelligence, but he can be saved from crime. The children with conduct disorders may have perfectly normal intelligence, or may be above the average intelligence, and they are hopeful when properly treated.

I wish to congratulate Dr. O'Hara and the State Board of Health on the endeavor that is being made to put a mental hygiene unit in the field. As I understand it, the plan is to have Dr. Unsworth, as head of the department, visit the various parts of the State; he, associated with a psychiatric social worker and a psychologist, will make investigations, deliver lectures, etc. Certain problem children will be found from the school records and these will be examined and treatment recommended.

In this way I feel quite sure that a great deal of benefit can be brought about, if the doctors get behind this project and give their support to the effort that is being made, very much can be accomplished.

Dr. L. V. J. Lopez (New Orleans): For the last seven years, as neuropsychiatrist of the Orleans Parish School Board, it has been my privilege to examine a great many children of the city of New Orleans who have been reported to the department of superintendence for truancy, vagrancy, and also on account of being repeaters, or repeating the various grades without making any progress in school.

It has been our problem in the public school system here in New Orleans to try to give these feebleminded children the education which would in later years make them useful and productive citizens rather than making them wards of the State. Of necessity, this requires a weeding out process. We naturally cannot expect, in spite of all the progress that has been made in medicine, to use a very vernacular expression, to squeeze blood out of a turnip.

As physicians well know, feeblemindedness, in contra-distinction to a psychosis, means an individual with lack of intelligence rather than one who has lost his intelligence or power of reasoning. In other words, a feebleminded individual, whether it is due to injury to the brain at birth as a result of prolonged labor or as a result of inflammatory processes to the meninges or the brain itself, or whether it is merely due to a condition of maldevelopment or undevelopment which may not have any pathological reason, can only be worked with through the innate endowment of that individual. In other words, you can go so far and no further.

It is up to the psychiatrist, in collaboration with the psychological branch, to determine just what biological level that individual can reach. We see some feebleminded children that can go as high as the fifth grade. We would probably class them as high-grade morons. They may reach the ten-year-old level according to the Terman scale of intelligence.

As Dr. Holbrook has pointed out, the school age is the golden age of mental hygiene. These children can be taught special vocations, such as cane weaving, cabinet making, simple types of carpentry, and so forth. In some instances we have been fortunate enough, where the child can pass the fifth grade to the satisfaction of the school board, to be able to place some children at the Delgado Trade School to learn some simple trade.

It has also been my privilege, as there isn't any regular psychiatrist assigned to the Municipal Boys' Home, to share some of the burden of examining these children Dr. Holbrook has told you about, particularly the types that are bad actors in school and have been sent to the Municipal Boys' Home through court action. Those children in the Boys' Home are, to all intents and purposes, not much different from ordinary children. They have their urges; they have their impulses, and they have their emotional life. The only difference between them and the normal child is simply that due to their lack of intelligence they lack judgment, are easily influenced by other children who have had more training and probably have psychopathic trends, and the result is that they are misled, and easily led into criminal acts.

Therefore, I wish to conclude by congratulating both Dr. O'Hara and Dr. Unsworth on their splendid program in mental hygiene in trying to make a thorough and careful investigation of the situation of the feebleminded in this State. I will admit that it is a very prodigious undertaking, and it is something which the national committee for mental hygiene headquarters in New York has tried by means of child guidance clinics to establish throughout the country. I wish this clinic, or department of the State Board, every

success, and also want to extend to them the co-operation of the School Board of this city.

Dr. L. L. Cazenavette (New Orleans): The subject is a very important one, and I am very much in accord with what has been said by those who have preceded me in this discussion, both Dr. Lopez and Dr. Holbrook.

The question is what to do with the feebleminded, that is to say, those who present an amount of abnormal mental development not sufficient, however, to prevent them from doing certain things in life.

I think it is a waste of time to push these children through ordinary school, those not only unable to cope with others of their age but those who cannot appreciate the great difficulties in attempting to do so. I feel it is a question of frequently removing these children from their immediate environment, because we very frequently find that the parents of these children are the ones who are less likely to take care of them.

Once we have established, as nearly as possible, the mental age of the patient, then I think we should try as much as possible to send those patients to some industrial school, or something of that kind, so that they might be able to do something and probably take care of themselves in some way during later life.

Dr. W. J. Otis (New Orleans): I am sure every social-minded individual in the State of Louisiana, and I hope every physician, will receive with great acclaim the fact that the Louisiana State Board of Health has established a department for mental hygiene. There is no reason why this State should not compete or rank with other States in the Union. Why shouldn't we?

The question for discussion is feeblemindedness and criminality. Not all feebleminded or mentally defective people at any time in their lives run afoul of the law. These individuals, depending on the grade and depending on their environment, never come in contact with the law; they never become anti-social.

The determining of what is a mental defective and what is not should be accepted on the intelligence quotient alone. A number of people make the mistake in mental defectives, or feebleminded, of using the intelligence quotient alone. It is not a fair test. The ten conclusive points should always be taken into consideration in determining these cases.

The question as akin to criminality: not all criminals are feebleminded. Any criminal who can perform the acts and do the disastrous deeds that some of these criminals do can certainly not be termed feebleminded. Their minds are much keener in a number of instances than our minds; their planning is much keener than our planning. Quite true, they have a criminal trend to their behaviorism, and they have a criminal trend of mind if you want to call it that, but that isn't a mentally defective mind.

A number of criminals may pose as feebleminded. Those of us who have to contact ourselves with lunacy cases, criminal cases and medico-legal cases know that these individuals have conferences among themselves and tell each other how to act; and some of them try to act. Of course, to label an individual a feebleminded criminal takes quite a lot of observation, and a number of visitations of the individual unobserved by the observed. If they know you are coming they are going to stage something for you. The best plan is to observe these people when they do not know you are observing them.

Again, I want to say that the state is to be congratulated. Dr. Unsworth and Dr. O'Hara are to be congratulated, and we hope for the best. If any of you people who are here at this time know of any instance where we can help, get in touch with the chief of the Mental Hygiene Clinic.

Dr. H. R. Unsworth (closing): The portion of my paper I considered vital was the statement made that individual psychologically develop along three levels: First, the intelligent level; second, the social level, and, third, the industrial or mechanical level, and that an individual may be considered feebleminded though his intelligent level may be above 75 (I. Q.) as measured by academic tests. The greatest factor in determining an individual socially feebleminded is a detailed study of his behavior life pattern. It has been my impression that all psychopaths are socially feebleminded individuals, though not necessarily falling below 75 (I. Q.).

I wish to thank the members for their remarks in regards to my paper, and it is my earnest hope that the Louisiana State Board of Health will have the opportunity to do something worth while in the establishment of a bureau for the recognition of early feeblemindedness and thereby diminish crime.

TEACHING AND CARE OF FEEBLE MINDED IN STATE INSTITUTION.*

R. C. TOMPKINS, M. D.,

ALEXANDRIA, LA.

All the states of the Union excepting five (Arizona, Arkansas, Nevada, New Mexico, Utah) have provided state institutions for the care and training of the feeble minded. The District of Columbia has recently established an institution for this type of case. One of the five states listed above (Utah) has recently had a survey made of its mental hygiene problems and one of the results was the recommendation for a separate institution for the care of the feeble minded, which I believe is now in the course of construction. So it will not be long before the list has been reduced to four. In Canada, a great deal of interest has recently been manifested in the care of feeble minded. Recently, Nova Scotia passed a bill establishing a school for feeble minded. Quebec has a new school for feeble minded. Recently Ontario has reorganized its institution so that a psychiatrist will be in charge instead of layman as formerly. British Columbia will probably soon establish a school, so it seems that with few exceptions most of the states and many of the provinces of Canada have state schools for feeble minded. Instead of a single school, many states have two or more schools. But even so, we are just scratching the surface. In Massachusetts the provision for feeble minded exceeds that of any other state and it has recently been estimated that only half of their cases requiring institutional treatment are receiving it. With these preliminary remarks, regarding the question in general, we will touch upon the condition in Louisiana.

Louisiana has one state institution for the care of feeble minded which was created by the Legislature of 1918, but due to lack of sufficient appropriations, did not begin to function until 1921 when 80 patients from the two state hospitals, were transferred as a nucleus. All of these were adults.

The law creating our institution placed no restrictions upon admission other than the applicant be feeble minded. It was apparently intended that we receive all classes of feeble mindedness and this is what we do. We have white and colored; children and adults; epileptics and non-epileptics, delinquent and non-delinquent; educable and custodial cases. The placing of these various classes in one institution makes the problem of their care and training a very difficult one. The major problem at present is one of classification. On account of our limited facilities, it is necessary that we have young children of 5 to 16 years and adults of 20 to 60 years, in the same building. It is necessary that the epileptics be in the same building with non-epileptic; that the delinquent and non-delinquent live together. This is indeed a very poor arrangement but it is necessary due to our very limited number of dormitories and our acceptance of all type of feeble mindedness. With our present facilities we are only able to segregate according to sex, color and on the basis of tidiness and untidiness. On the colored wards, we are unable to separate the tidy from the untidy.

The caring for epileptic patients in a school for feeble minded is a very poor arrangement and is not fair to either class. The epileptic presents a separate and distinct problem and should be handled as such. We will soon have $100,000.00 available with which it is planned to begin the erection of buildings to care for epileptics. These buildings are intended to be the nucleus of a separate institution for epileptics. They will be situated on the present property of the State Colony, but at such a distance that later separation of the two institutions will be possible. For the present, they will be under one management.

In a like manner, the caring for delinquents in a non-delinquent population pre-

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sents many difficulties. Just as the delinquent or criminal adult cannot adjust himself in civil life, and the delinquent child cannot get along with normal children, so the defective who is also delinquent cannot adjust himself in a population of non-delinquent defectives. The problem has been met in a few of our more progressive states by erecting separate institutions for the care of defective delinquents. However, most of our states are a long ways from obtaining such a desirable goal and it is necessary that they be cared for as at present. But provision should be made for the caring of these cases in separate units removed from the others. No one not familiar with this problem can realize the trouble and worry that these defective delinquents cause. The care of 1 such case probably entails more trials and tribulations than 100 non-delinquents.

I will not attempt to discuss the medical aspect of this question in my limited time, but will skip over and say a few words regarding their training.

We have 466 patients in our institution and of this number 111 are attending school. In addition about 150 others are engaged in some sort of vocational work about the place. The school proper includes the sense training class, the kindergarten, first, second, third, fourth, fifth and sixth grades. This is just about as high as a feeble minded individual can go. The sense training class is the most elementary class and is for those pupils who have a mental age below 5 years. They are taught such elementary things as the recognition and identification of various colors, various forms such as round and square, various sounds from different instruments or whistles; the recognition and identification of taste of various substances as sour, bitter, sweet, and salty. In addition they are taught to lace and unlace shoes, to button and unbutton clothes. In other words as the name suggests, the training of the five senses. In addition to this, habit training to care for bodily functions is stressed.

The other grades from kindergarten to sixth more or less follow the similar grades in our public school except that probably a bit more attention is given to manual work. Of course, instead of completing a grade each year as a normal child does, the feeble minded child takes 2 or more years to make a grade. This usually occurs around 16 years.

After the child has reached the height of his or her development, he or she is given vocational work commensurate with his or her physical and mental equipment such as sewing, rug making, working in laundry, dairy, farm, and with florist. Again we are handicapped on account of lack of suitable equipment. We need an industrial building for boys and girls where other forms of manual training could be taught such as broom, mat and brush making, printing, woodworking, basketry, tailoring, cobbling, etc. This industrial work is extremely important. It goes without saying that the scholastic work is very important but it is the feeble minded person's proficiency in some manual work that he or she must rely upon to earn their living later. This fact should never be lost sight of, that the entire training is arranged so as to enable the child to be self supporting or partially so in later life. The work taught should be fairly simple so that the child will ultimately be able to become proficient without much supervision. There are a large number of pupils who will always remain custodial and part of their training should be arranged with this in mind. The care of wards and clothes room and the care of the smaller helpless children should be taught as it is of decided benefit to both pupil and institution. The fact that the child is able to accomplish something, no matter how small, is of considerable importance. It lessens his feeling of inferiority and gives him the price of accomplishment and helps to make him contented and happy. In the final analysis, the happiness of the child is what we are striving

for, provided this happiness is not obtained by encroachment upon the rights of others.

It goes without saying that the teachers should be especially trained in handling this class of patients.

Recreation and amusement should never be lost sight of as true to the old saying, "all work and no play makes Jack a dull boy." The play should be well organized and under a director so that each child will take part. The amusements are varied to individual conditions existing. One effective means of discipline is preventing a child attendance at some of the various amusements for a varying period of time.

DISCUSSION

Dr. C. V. Akin (New Orleans): This is not the first time I have been called upon to discuss an excellent paper by a recognized authority on a subject of which I had but little or no personal knowledge. This is, however, my initial effort without the benefit of collateral reading or conference with better men and I stand before you acutely aware of my shortcomings. My first glimpse of Dr. Tompkins' paper was last night at 7:30 when I returned to my office after a three day absence from the State and before attempting comment I wish to apologize to Dr. Tompkins and to you for my apparent presumption.

As a professional public health worker of over 15 years experience, I am vividly aware of the problems which confront State authorities charged with the care and training of the feeble minded. Dr. Tompkins has ably summarized the problem in some of its complex ramifications as applying within a State institution. The indiscriminate association of all classes of feeble minded persons under one roof is manifestly unscientific and uneconomic and tends to defeat the purpose for which those lacking in normal intellectual development were brought together. The solution obviously lies in the provision of more institutions to care for the conflicting classes as catalogued by Dr. Tompkins. This calls for more money; lots of it; and this is apparently the closed season where such calls are concerned.

From the economic standpoint, it must be agreed that institutionalizing the recognized feeble minded is the most efficient and least expensive procedure to be suggested as capital outlay, maintenance and overhead are reduced when the individual subjects are removed from the home and community environment and collectively cared for at suitably located colonies and schools.

Of prime importance, is more exact knowledge of the extent of the problem throughout the State and these data must then be integrated with schedules showing specifically cost to State of the whole group, controlled and uncontrolled. Such studies are rendered exceedingly difficult by the fact that except in well developed cases recognition of the state of feeble mindedness is not an easy matter and may not be diagnosed by physical appearance or by some outward expression or peculiarity. Retardation may not be evidenced until the child attends school and after repeated attempts fails to advance. If neglected at this crucial point the feeble minded child enters the period of greatest danger as susceptibility to evil influences is most marked in this group. Close co-operation between school and public health forces is vital if those who require special attention are to be weeded out and given protective and developmental care and training. Dr. Tompkins tells us that his colony numbers 466 patients, which we may assume is only a fragment of the group requiring institutional care in Louisiana. This conclusion is based on the fact that in New York State out of the thirty odd thousand known feeble minded only about 12 per cent were cared for in special institutions in 1914.

Dr. Tompkins further states that, if his colony population, 111 are attending school. I think that the Superintendent of the State Colony and Training School is to be congratulated on his record of 24 per cent school attendance in a group embracing all classifications of feeble mindedness.

Those who are unfamiliar with the demands of institutional care of these cases cannot comprehend the requirements for patience, tact, tolerance, stability, humaneness and devotion to duty exacted of training and teaching staffs. In contrast to the vital, plastic minds which make up the material with which the public school system works, Dr. Tompkins and his associates must labor with a group for which mental fog rather than intellectual sunshine is the rule. His function is to salvage those for whom there is some hope and through infinite care to restore them to a useful, though necessarily restricted life.

It is held by some that social, moral and emotional discipline and example are more important for the defective child than strictly scholastic training. Protection from improper knowledge and association is essential, especially at puberty and adolescence. Special training and association in order to modify traits of disposition, personality and character, for strengthening desirable traits and repressing undesirable ones constitute the task of staffs of institutions for the feeble

minded. Vocational and manual training, carefully adjusted to meet the requirements of the individual problem, are indispensible to successful development of the defective child. Preliminary to and supporting such developmental efforts is the scholastic training through which may be determined the capacity of the given child for readjustment.

According to one authority (Fernald, Men. Hyg. 8:964, 1924), defective children who succeed in life do so because they become capable of doing worth while work with their hands. He considers this to be the end and aim of all training with such children.

I deem it a privilege to offer to Dr. Tompkins every resource of the Parish Health Unite Organization to further the admirable work he is doing.

Dr. W. J. Otis (New Orleans): Of course, occupation is the best panacea for idleness both in the normal and in the subnormal individual. The step taken in Louisiana to attempt to bring this state to the fore in comparison with some of our sister states is quite an effort. It is a project that is going to require much painstaking attention, much impersonal assignment or alignment of things only for the good of these afflicted people. Directly that you lose sight of the effect, directly that you lose sight of the personal side of these people, who are children, you do not gain, you do not make any attempt; neither do you bring to the fore—not only for the state but for the United States—the good that can be accomplished.

I mean by that you must have intelligent teachers, I don't care in what state. If they can be obtained in Massachusetts, New York, Tennessee or Connecticutt, the same can be obtained here. Only place individuals who are capable. Occupational therapy needs specially trained men and women who give their lives absolutely to that purpose; not an individual with a high school training who is a friend of some friend, who is a friend of a friend, who knows nothing about the social contact of the mentally defective, who knows nothing about the problems that we encounter in these children who have tantrums at nine o'clock, who are happy at eleven o'clock, who are crying at twelve o'clock, and who at three o'clock apparently act like normal children. Those things should be borne in mind.

Then, too, you have to have a sympathizing type of individual, not necessarily morbidly sympathetic. Of course you have to temper firmness with kindness in handling these people.

I should like to ask the doctor what percentage of his colony are really self-supporting, as it were, inside the institution. In other words, could a certain percentage of his population be paroled outside as other states are doing? Does he contemplate a parole system? How is that to be managed? Also, I should like to ask how many applicants he has on the waiting list?

Dr. R. C. Tompkins, Alexandria (closing): I enjoyed Dr. Akin's discussion very much. I don't believe Dr. Akin asked any questions.

We have a parole system, and we do parole them, you know; just what per cent I couldn't say right now. I couldn't say now what percentage would be eligible for parole. I would say ten per cent, anyway, at the present time.

We have 150 that do dairy and farm and different work around the institution. That is about one-third.

I fully agree with the doctor about occupational therapists. They should be very competent. We are handicapped there by lack of funds and appropriation. We hope to be able to do that as soon as we can get the appropriation.

I suppose there are about 600 or 700 on the waiting list. I wish to state that we are crowded right now. I took charge of the institution the first of October, and I have taken in 100 since I have had charge. We have filled up all available space.

THE PUBLIC HEALTH ASPECT OF VENEREAL DISEASES.*

O. C. WENGER, M. D.,†

Hot Springs, Arkansas

It is my privilege to appear before you today as a representative of the United States Public Health Service, with a plea soliciting your support and co-operation in the prevention and control of venereal diseases. The success or failure of this nation-wide program depends more upon the attitude and co-operation of the medical profession than upon any other one factor. Without the support of organized medicine, which means you gentlemen who are in active practice, this program will fail. As the matter now stands, we of the Service, who are responsible to the American public, through an act of Con-

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†United States Public Health Service, Venereal Disease Clinic.

gress, for the administration of this program have been forced to the conclusion that the individual physician and organized medicine are not carrying their share of the burden.

Shall it be said that a profession, which in the past, has made such progress in the control of yellow fever, typhoid, tuberculosis, small pox, and diphtheria, will calmly stand by and see the ravages of what is now considered one of the most important public health programs of the age go unchallenged?

Gentlemen, I say in all sincerity, that the venereal diseases are a challenge to our profession, which we must accept if we hope to retain the confidence of the public and our own self-respect. We believe that these diseases can be controlled by the application of certain principles embodied in our program, but this program is built on the co-operation of the men who are practicing medicine today in the United States. This means that every member of this society and every other society must do his part.

The principles are as follows:

1. Early recognition of infection by careful physical examination, with complete records of each case.

2. Ascertaining the source of infection which is to be reported to the local health officer at once.

3. Adequate treatment in the early stages of the veneral diseases, and in the case of syphilis treatment for three years and careful observation with semi-annual check-up continued through the fourth and fifth year, at a fee within the patient's earning power.

Co-operation with Federal, State and local health organizations.

EARLY RECOGNITION

Recognition of syphilis in all of its different manifestations is only possible after a thorough physical examination, with the patient stripped. We should remember that weeks or even months may have elapsed before the appearance of the initial lesion. Yet we know that the patient's infection actually dates from a few hours after exposure, and not from the first appearance of the lesion. In other words, when the patient presents himself for examination to his physician with a local lesion, the disease is no longer local, but a general systemic infection has existed for several weeks before the local lesion appeared.

It is for this reason that abortive measures at this stage will not be successful.

The keeping of proper and complete records is very important in the treatment of venereal diseases. This is especially true of syphilis. No physician should trust his memory to keep records. The physician who is too busy to keep proper records should in fairness to the patient refer him to someone else for the necessary treatment. One cannot treat syphilis successfully without records.

SOURCE OF INFECTION

It is just as important for the attending physcian to get the source of infection from the patient as it is to treat the individual patient, from the standpoint of public health and preventive medicine. It is surprising how many sources of infection can be uncovered and brought under treatment if the attending physician will just take a little time and trouble to get this most necessary information. Many times the patient will bring his sexual partner to the physician for treatment, if not then such information should be reported to the local health officer at once, with a request that he report his action back to the physician.

In a small community one foci of infection, if not discovered and brought under control, may be responsible for many cases. This is especially true in the case of a woman. I recall one instance where 16 cases of gonorrhea occurred in a small lumber camp in Arkansas. An 18 year old girl

was responsible, and unfortunately two innocent wives were infected. This is just one instance in many that could be related. The physician who co-operates with the local health officer in this regard might, by so doing, prevent an infection of someone who is close to him.

ADEQUATE TREATMENT IN EARLY STAGES

By adequate treatment in the early stages of syphilis we mean that treatment be instituted immediately since every hour counts. This is very important and cannot be overestimated, if we hope to prevent later manifestations of the disease and protect others from infection. It is an accepted fact that it is the treatment the patient receives in the first few days and weeks of his infection which determines the end result, and it is in this period that treatment must be pushed to the very limit of the patient's tolerance if there are no counter indications.

It is a safe rule to follow to give energetic and continuous treatment to the young patient with syphilis who is otherwise physically fit, and to be very cautious in treating patients who have had their infection for years, even in the face of positive serology and clinical evidence of the disease. While no definite standard can be safely outlined, due to individual idiosyncrasies of the patient, one may say in a general way that the young patient with early syphilis should receive not less than 25 doses of arsphenamine and 100 doses of mercury or its equivalent in bismuth, the first year after his infection, even though the Wassermann becomes negative and clinical symptoms have disappeared.

During the second year probably half of this amount will suffice if no clinical evidence appears, and the blood, spinal fluid, and cell count is negative. During the third year, with no clinical symptoms one may repeat the course outlined for the second year as a precautionary measure. However, if the serology becomes positive, or clinical symptoms appear, more energetic treatment is indicated. The appearance of any neurological symptoms, continued positive reactions, or non-improvement of the patient for any reason demands consultation.

In late syphilis one must be more cautious, even in the face of clinical evidence and positive serology. There is no reason to believe that these old cases who have been infected for many years, and usually with indifferent treatment can ever hope for more than temporary relief. Eradication of the infection is out of the question because tissues that have been invaded have undergone certain definite pathologic changes, which no amount of treatment will improve, but frequently does a great deal of harm. Deal gently with these cases. It is of no benefit to the patient or his family to have his life shortened by the indiscriminate use of such therapeutic and toxic agents as arsenic, mercury, and bismuth. Temporary improvement, under mild treatment, is all that can be expected.

FEES

One of the most important factors in the control of venereal diseases is the unequal ratio between the fees charged by some physicians as compared to the patient's earning power. As pointed out by Moore in the February number of Venereal Disease Information, a monthly publication of the U. S. Public Health Service, the majority of infections occur in later adolescence and early maturity when the patient's earning power is comparatively low. This is an unfortunate situation, both for the patient and the attending physician. It is, I believe, a well authenticated fact, borne out by a review of some 20,000 histories in the U. S. Public Health Service Clinic in Hot Springs that many patients are charged fees not only in excess of their income, but entirely out of proportion for the treatment the patient received.

This one fact is responsible to a great extent for the later tragedies in the lives of these patients. Time and time again

have patients told us of the exorbitant fees charged for treatment, which amounted to nothing more or less than mild blackmail, since the physician took what any reasonable person would consider to be an unfair advantage of the unfortunate patient.

No physician worthy of the name would refuse to operate on a case of appendicitis, or treat a child with diphtheria, just because the family could not afford to pay the regular fee. He most certainly would be condemned by his colleagues and the public at large if he permitted a patient to suffer and possibly die of neglect if he persisted in his attitude. Yet it happens time and time again that patients are refused treatment in early syphilis, when it is so important, simply because the patient cannot pay the fees charged for the administration of arsphenamine or an injection of mercury or bismuth. Such an attitude on the part of the physician should be severely condemned because it puts the entire profession in a bad light.

In the February number of the A. M. A. Bulletin an article by the new president-elect is illuminating on this very question. The patient who is refused treatment does one of two things. Either he takes no treatment whatever, and later becomes a charge on the local community, which the physician as a taxpayer helps to support; or the patient makes his way to a large medical center, oftentimes undergoing great expense for transportation and maintenance while taking treatment as a clinic patient. Again, the physician as a taxpayer, pays his proportionate share for this free treatment. In either instance the physician suffers a direct financial loss.

Perhaps there are some of you who feel that free clinics are an infringement upon your practice. It might be interesting to report the results of a recent survey made by the U. S. Public Health Service in the State of Tennessee. In this survey 85 per cent of 1,684 cases of acute gonnorrhea were treated by private physicians and only 15 per cent in public clinics. In the same state 60 per cent of early syphilis was treated by the private physician, and 40 per cent in the clinics. In late syphilis these figures were reversed, approximately 60 per cent were treated in clinics and 40 per cent by private physicians.

It is not hard to explain this condition. The treatment for gonorrhea is not as expensive as the treatment for syphilis. Therefore the patient is able to pay his physician the usual fee charge for such treatment. In early syphilis with higher fees only 60 per cent of the patients go to private physicians. Now in late syphilis we find that only 40 per cent of the patients find themselves able to pay for private treatment. One can readily see that as the patient gets older and becomes more incapacitated as his disease progresses he is forced into the clinics.

Would it not be better for the physician and the patient if the fees charged in early syphilis were such that the patient could afford to continue treatment over a longer period of time, and possibly prevent the manifestations and tragedies of late syphilis?

CO-OPERATION WITH LOCAL, STATE, AND FEDERAL ORGANIZATIONS

As practicing physicians duly licensed by a State Board of Health it is your duty to report all cases of venereal diseases that come under your care as required by law. It is just as important to report venereal disease as it is any other infectious or contagious disease. Yet we find that physicians as a whole throughout the United States are not obeying the law. It is unreasonable to believe that professional men who are honored and protected by a State License Board will permit indolence and general indifference to interfere with this important duty. I have yet to hear one good argument from a physician as to why he would not report these cases. Certainly, as physicians, we are interested in the gathering of valuable statistics, but unless the physician who sees and treats the majority

of these cases does not report them as required by law, the Federal and State Health agencies are working under a severe handicap.

COMMON ERRORS IN DIAGNOSIS AND TREATMENT

Recently we had occasion to go over some 20,000 records of patients who were treated at the Government Clinic at Hot Springs. In this review certain interesting facts were brought to light, which are the basis of the following conclusions:

The general profession, as a whole, does not recognize syphilis, nor even suspect it in the face of clear evidence.

The Wassermann and darkfield examination necessary to detect early syphilis are frequently omitted, or improperly interpreted.

The physician still too frequently accepts the patient's statement that he had a "soft chancre" without further investigation.

A negative Wassermann generally eliminates the possibility of syphilis from the physician's calculations, despite clinical evidence to the contrary.

Many physicians erroneously believe that aortitis is simply a valvular disease of the heart and give no thought to its syphilitic etiology.

A history of repeated miscarriages in the female frequently does not raise a suspicion of syphilis.

Gumma are usually assumed to be caused by varicose veins.

Patients with ununited fractures are permitted to lie in bed for months without a suspicion of syphilis.

The gastric crisis of late syphilis is commonly diagnosed as "gall stones," "chronic appendicitis," "gastric ulcer," or "stone in the kidney," and sent to the operatng room for surgical interference.

Pellagra is frequently diagnosed as syphilis, and vice versa.

Gumma are oftentimes termed malignant, especially in the mouth and on the skin.

Early optic atrophy, iritis, choroiditis, retinitis in several instances have been treated by eye men without a suspicion of syphilis.

Deafness, particularly of the nerve type, is treated with inflations, without regard to cause, which in two cases coming to my notice proved to be syphilis.

Strictures of the rectum are rarely diagnosed, and incontinence of urine due to neuro-syphilis or a hypertrophied prostate are frequently overlooked by the general practitioner.

Paresis seems to be only diagnosed by the expert medical witness after a murder has been committed. It is rarely considered by the general practitioner to account for the patient's behavior until after he has committed some crime or become frankly insane.

Apparently all syphilis must agree with the usual text book picture illustrations at the time of examination. That is a circumscribed lesion on glans, mucous patches in mouth, alopecia, and a positive Wassermann, with a macular rash on body. On one occasion, at least, a patient with practically all these symptoms was able to persuade his physician that he had not exposed himself for months and so the condition could not possibly be syphilis. As a further criticism of the physician I might say that he saw only the penile lesion but did not take the trouble to strip and examine the physician.

The social standing of several of our patients was enough evidence to preclude the possibility of syphilis in the minds of their physicians.

The wife and children of a known syphilitic are usually not considered nor examined for possible infection.

Spinal tests, as a rule, are not done except in hospitals and in larger cities.

The old gonorrheic is still being treated for rheumatism and arthritis, with salicylates and other drugs. A prostatic massage or investigation of the deep urethera was rarely reported by the patient.

Spurs on the os calcis are either diagnosed as rheumatism or fallen arches, and the patients come to the clinic with arch supports. Strictures are frequently overlooked, and just as often diagnosed when none exist.

The dorsal slit is still popular among a large group of our profession, especially when the lesion is covered by the prepuce. There is no objection to the dorsal slit if done under hospital conditions, with the necessary follow up treatment. What usually happens, however, is that the slit is made in some doctor's office and the after treatment is neglected until the entire organ is involved. We found it necessary to amputate in four cases in the last nine years.

Innumerable cases in this study had been diagnosed as neuritis. Teeth were extracted, tonsils removed, appendectomies performed, and sinuses drained without any examination of the prostate, probably because the patient denied gonorrhea.

Is it a wonder that so many cults in medicine are prospering with pseudo-sciences and victimizing a gullible public at the expense of the regular physician? Go into any drug store and gaze upon the shelves at the many different nostrums now on the market, which earn the American public the unenviable reputation of using more patent medicine than any other nation on the globe. Are we as a profession not responsible for at least part of this evil?

Gentlemen, the facts disclosed by this study are indictments against our own profession. Whether we are guilty or not, I leave to your judgment. Any improvement in this situation will depend upon the cooperation and interest you gentlemen take in the matter.

In conclusion may I thank you for your courtesy and attention, which is appreciated. The U. S. Public Health Service is ready to do whatever possible to aid you in the solution of venereal disease problems.

DISCUSSION

Dr. J. E. Knighton (Caddo, La.): I really don't feel competent to discuss this paper, but I appreciate it for its real worth. I believe it has called our attention to many things that we need to think about.

My work is confined to internal medicine and I, like every other doctor no doubt, come in contact with conditions in patients that are due to the oversight on the part of physicians who have seen them earlier and, in part, due to the neglect of the patients themselves.

I think it is well that papers like this be brought to the attention of the physicians as well as to the public, that the people themselves may be educated along the lines of the necessity for applying early for treatment, and staying with the physician that treatment may be carried out over long periods.

I think the doctor's criticism with reference to the financial side of the question is very appropriate. We all remember when, for instance, the intravenous method of treatment was first begun. We looked upon it with the gravity of a major operation, and it was a common thing for physicians to charge fees commensurate with the gravity of a major operation. Of course, we recognize now that that is all wrong, and we must take into consideration the economical side of the question, remembering, as the doctor pointed out, that if the patient fails to stay with the treatment for a sufficient lengh of time to be really well, and cured where it is possible for him to be cured, ultimately we as taxpayers are paying the expense of the mistake.

There are so many good things the doctor called to our attention. I can't recall them all, but I really do appreciate it and I think the paper is very appropriate.

Dr. R. McG. Carruth (New Roads, La.): I was so impressed with Dr. Wenger's paper that I wish it could be put upon the radio in popular language so as to reach every household in the State of Louisiana.

While I practice in a small town, I have devoted some special attention to venereal diseases for the past twenty-five years or more. And while I do not do anything like the amount of practice in this line that specialists do, I have kept records

of every case I have treated. I want to say that some years ago it was impossible to hold our cases. We never held them. They would come in, whether for gonorrhea or syphilis, get two or three treatments—I am going back before the days of salvarsan, since I have been practicing forty-nine years, a longer period than most of you gentlemen here,—and as soon as their discomfort would be relieved, we would, in most instances, never see them again. More than once I have refused to take a patient's money when he would not promise to return regularly for treatment. Only a short time ago I had ten dollars laid on my desk for one single prescription and I told that patient that I would not relieve his discomfort and turn him loose upon the world a carrier for the balance of his life for his ten dollars or his one hundred dollars. I wanted to impress him, and told him if he would promise to be faithful and return to me regularly until he was most probably free from the disease, (and I know that we can never be sure of this, although, probably more or less certain) I would take his case, otherwise not.

And I wish to say right here that this is one of the reasons why I am so insistent about a hygienic marriage law, because since we have had a marriage law in this State, as imperfect and ineffectual as it is, we do hold our cases a little better than we ever held them before. Young men come to me and say, "I know if I do not get cured, when the time comes that I may want to get married, I may be turned down."

Now, so far as being turned down is concerned, I must say that I turn them down all the time, but they go up the street or down the street, or across the river to the nearest big town and get their certificates without any trouble. I do not know of a single case that has failed, and I have put out a little questionnaire on the subject in our parish medical society.

I wish to ask Dr. Wenger, if he will not, in closing, kindly tell us more in detail as to his method in treating syphilis. He spoke of giving twenty-five shots of arsphenamine during the first twelve months. This has not been the method I have followed, although I would not at all advocate mine as against his,—a specialist's. They won't always come back, but we do the best we can. I have always tried to give them six shots, then a rest of about a month, of course keeping up the subsidary treatment; then six more shots followed by the same intervals, and then six more, and then advise them to come back in a few months, and thereafter semi-annually or annually for repeated blood tests.

Dr. J. M. Adams (Baton Rouge): I should like to ask Captain Wenger what line he draws between a new case and an old case. I am particularly interested in this because I am making blood examinations on a group of negroes and find histories of syphilis dating anywhere from two months to twenty-five years. I have been advising all of these cases to take treatment with a view to health preservation, and I want to know how much harm I have been doing.

Dr. O. C. Wenger (Hot Springs): In speaking of early syphilis, we refer to primary and secondary syphilis. The routine we carry out in Hot Springs in the treatment of these cases is 25 doses of arsphenamine and 100 doses of mercury intramuscularly during the first year. We prefer arsphenamine to neo, and give 0.4 gram twice a week for six weeks. At the same time the patient receives one-third grain mercury benzoate intramuscularly three times a week. For the six weeks course the patient receives 12 doses of arsphenamine and 18 of mercury. If the patient can remain longer, the mercury is continued, providing no contra-indications such as kidney irritation develop.

The patient then returns two or three months later when 12 more doses of arsphenamine are given. The mercury is continued.

This treatment gives us the best results in early syphilis. We no longer speak of "curing" syphilis, but rather speak of arrested sypmilis, as we do of tuberculosis.

In answer to the question how much treatment should be taken by a patient before he is permitted to marry I can only say that I personally have advised against marriage at any time in most cases. As a physician, I would not be willing to let a man marry my own daughter if I knew he was at one time infected with syphilis. Each physician should ask himself whether he would be willing to advise marriage of a known syphilitic to a member of his family. A patient with syphilis, if he is wise, will live the rest of his life under medical observation, with frequent physical examinations. This seems a rather broad statement, but those of you who are doing special work in internal medicine will agree with me that late manifestations of the disease are very common.

In latent syphilis the treatment must be more guarded. Inunctions may be preferable where the patient refuses to take the intramuscular route. Mercury by inunction has several disadvantages as proven by our experience in Hot Springs. Formerly we used the inunction method entirely in the following manner: All of the patients, some two or three hundred in number,

were first given a hot, soapy bath, followed by a rub down. The patients then arranged themselves on long benches, one in front of the other and each patient rubbed a quarter ounce of 50 per cent mercury ointment into the back and shoulders of the man in front of him. It took approximately thirty minutes for the mercury to be rubbed in. The patient replaced the clothing after the excess of mercury had been removed and went on his way. He received a rub like this every day in the week except Sunday. In many instances we had a great deal of trouble with skin infections following this treatment and toxic symptoms, because we have no way of controlling the dose of mercury by the inunction method.

The ideal way is to have the mercury rubbed in by a trained masseur, when this is possible. It is unsatisfactory to have patients rub themselves. One must remember in treating a patient who has had syphilis for ten or twenty years and has no clinical symptoms, except a positive Wassermann to proceed with caution. If arsenic, mercury, or bismuth is used the patient should be carefully watched. The point I want to drive home is that in these latent cases of syphilis the ultimate cure is out of the question. Syphilis attacks the blood vessels early in the course of the disease, and certain pathologic changes have taken place which the stethoscope and roentgen-ray may not reveal. Remember, too, that the liver and kidneys of a man of fifty, especially one that has had syphilis for some ten or twenty years, may break down under therapy. In these late cases you are just as likely to do more harm than good by over treatment.

I do not believe that the clinical results between arsphenamine and neo-arsphenamine can be compared. Arsphenamine is by far the better drug. However, one should have some experience in the neutralization with sodium hydroxide. For the man in the country, neo-arsphenamine, which requires no neutralization, is much safer.

In answer to the question about sulph-arsphenamine, I can only say that we have had three deaths from its use. I believe sulph-arsphenamine is more toxic than arsphenamine, and, furthermore, we found no advantage in its use.

In regard to bismuth our experience has been very limited. We have found, however, that bismuth causes gingivitis and irritates the kidneys just as much as mercury. The injections are much more painful to the patient, and there has always been a question in my mind of just how much bismuth is absorbed when put into the muscle. Certainly, the danger of abscess is increased.

Some experiments are now being conducted at the Public Health Service Clinic at Hot Springs on bismuth. The results will be announced later.

In regard to the use of the iodides: Clinically I think they are of great value. Our problem in Hot Springs is somewhat different from that of the general practitioner. All of our patients are indigent and therefore cannot remain under treatment as long as we wish. Therefore, we are concerned about getting the patient non-infectious at the earliest possible time and pass him over to the family physician who continues the treatment, so we give the patients arsphenamine, mercury and K. I. all at the same time if it is necessary.

Dr. Toler: You spoke of fees or the experience you have had with patients from different localities. I should like to know just what you would consider the average fee for each individual case.

Dr. Wenger: Certainly it all depends upon the man's earning power.

Dr. Toler: With the average earning power, what would be the average fee?

Dr. Wenger: Let's assume the patient earns a hundred dollars a month and is unmarried. This patient must pay room and board. Part of his salary is usually given over to help take care of the other members of his family. It would be far better to say to this boy, "Look here, I will treat you for one year for two hundred dollars." This is better than charging five or ten dollars a dose for injections. The patient should be able to pay $20.00 a month for his treatment. If he must pay more than he can afford he feels it cheaper to borrow money and go to places like Hot Springs. He does not consider the railroad fare to and fro from Hot Springs, the cost of maintaining himself while taking free treatment, or the money lost in wages for six weeks. All he thinks about is that he can get free treatment. So it comes down to this: if the local physicians overcharge these patients, the patient simply spends his money for railroad fare and mantenance, money which rightfully belongs in his home community. When these facts are considered and brought to the patient's attention he will be willing to pay a reasonable sum monthly for his treatment.

Dr. C. M. Horton (Franklin): As you know, syphilis is very prevalent in the colored race, and as they are largely our servants sometimes the question arises as to the danger of employing these people as cooks, chauffeurs, and general men of work about the place. Some time ago it was discovered that the chauffeur in a white

family had had an original lesion and the question was asked me as to the danger of employing that boy. I discussed the question with one of the urologists, and his reply was if we gave the man five or six injections of neo he would probably be all right.

What is your opinion about employing cooks or men about the house who are known to have syphilis, and who still have it? If you discharge one, you probably get one that is worse, or a newer case.

Dr. Wenger (closing): To answer Doctor Horton's question:

The urologist might make the patient non-infectious temporarily with five or six injections of neo. By that I mean the lesion would probably disappear after that treatment. However, mercury should be given at the same time.

The danger of infecting others from cooks, chauffeurs, etc., depends entirely upon how closely they are associated with other people. Danger of infection through food is rather remote. However, to be on the safe side, these patients should not be employed until they are non-infectious.

THE PREVENTION AND CONTROL OF TUBERCULOSIS IN CHILDREN.*

EMILE A. BERTUCCI, M. D.,

NEW ORLEANS.

Until a specific substance is found that will combat the ravages of the white plague and to act as an agent that will specifically cause an immunization against the invasion of the tubercle bacillis in the human organism, we can only hope at the present time to strengthen our prophylactic forces against an enemy that slowly but steadily is claiming many victims annually. Some of the present day methods of endeavors to produce immunization in children is only a forerunner of what might be done with this gigantic problem. Until then we must be satisfied with safeguarding our children with all the possible prophylactic measures at our command and to establish an unsurmountable barrier from the invasion of this arch enemy of destruction.

*Read before the Orleans Parish Medical Society, March 11, 1929.

The purpose of this paper is to convey the facts and situation that might be studied in the prevention and control of tuberculosis in children from a prophylactic and hygienic point of view, to build upon what material we have now available, to elaborate and to recognize methods, to instruct communities, to weigh circumstances, to size up situations that might prove a helpful adjunct in the control of this disease in the child.

The so-called specific prophylactic biological methods that have been used in the past and are now being used have had their pros and cons and their small percentage of followers which advocate these methods have fallen by the wayside to ultimately yield, by failures and to return to natural prophylactic methods until some future time when research work on this subject will have reached its highest pinnacle of perfection and success. The probability is therefore that the great part of the work of medical men is hereafter to be done in preventive medicine and in regard to tuberculosis preventative medicine is already a fact. I feel that tuberculosis crusades promise great benefits and I look for a natural diminution of infection from extended and intensified prophylactic methods and for sufficiently striking changes in the direction of a lowering of the frequency of infection together with a reduction in the morbidity and mortality.

It is in the last analysis an education of the people in social hygiene and every kind of education should begin in childhood. Of late years, special study has been devoted to tuberculosis in children for it has been been found that the disease is much more frequent in childhood, than was formerly supposed, that the frequency increases with the age, the greatest frequency being between five and fifteen years of age. Autopsies made upon children reveal considerable amount of tuberculosis of the glands, or other parts of the body. Autopsy statistics have shown that tuberculous infec-

tion is found in about 40 per cent of all children dying under fifteen years of age.

In my examination of approximately 10,000 school children during the past two years, about 20 to 25 per cent gave evidence of tuberculosis, of course I do not mean active pulmonary disease but the inactive form or what I term the pre-tuberculous type of which I will explain later.

Other medical examiners in Paris schools have found as high as 40 per cent with signs of the disease. In New York, the examination showed about 30 per cent of tuberculosis of the lungs.

Dr. Wm. C. White of Pittsburg stated that 90 per cent of all school children in large cities have tubercle bacilli in their system before reaching the age of 19 years. Hamburger, a German authority, stated that he found latent or inactive tuberculosis present in 71 per cent of children from 7 to 10 years and in 94 per cent from 11 to 14 years.

I believe that most cases of adult tuberculosis become infected in early life in childhood, as the figures first cited appear to show—and that during this period the disease remains inactive or latent, that is showing no symptoms. When the child however undergoes the stress and strain of study and confinement in school, or in adult life enters into the struggle of earning a livelihood, with all the coincident depressing influences upon the health, the tuberculous infection, before latent, becomes active and tuberculosis in some form developes.

Tuberculosis in early life is responsible for many far-reaching disabilities, and not a few of life's long postponed disasters. If we are to prevent tuberculosis in children we will naturally have to consider the mode of infection.

If so large a proportion of children as I have indicated have tuberculosis in some form, how did they contract it? First of all—children as we know are more susceptible to it than are adults. They cannot resist unhygienic surroundings as well as adults and add to this, a case of tuberculosis in the home, and we then have the conjunction of favorable soil and the seed. It is probable then, that very many cases of tuberculosis in children arise in a consumptive home. Some cases are contracted from other school children and occasionally from a tuberculous teacher.

With regards to the channels of infection, whether by inhalation or through the intestinal tract, this does not make much difference, for the method of prevention is the same as we shall presently see.

There is another view as to the cause of so much tuberculosis in children and that is a contaminated milk supply, but although our modern health regulations has reduced this source of infection to a minimum, there is still a wide diversity of opinion as to whether milk containing the bovine bacilli is responsible for the infection in children, and while it frequently does we have not sufficient proof and much against this. For example in Japan where there are no cattle milk is never used as infant food but tuberculosis is just as frequent as in countries where milk is used. In Constantinople where the mothers invariably nurse their children, tuberculosis is very prevalent. Again, the prevalence of tuberculosis among Esquimaux in Greenland where mothers invariably nurse their young for a long period speaks against a source of infection from milk supply of cattle. Koch himself stated that bovine bacillus is rarely found in human beings, and does not believe that milk is a frequent cause of tuberculosis in children. On the other hand many authorities state that bovine infection in children through milk will cause tuberculosis of bones, joints, glands and intestinal tract, which recent investigation has proved to be a fact. However, we should still use every means to safeguard the milk in the present state of our knowledge upon this subject by assuring ourselves that it comes from healthy cows, or by sterilization.

We must therefore regard the chief cause of pulmonary tuberculosis in children as house infection and a child in a home where there is a case of tuberculosis particularly when it begins to creep and handle things and puts them in its mouth, has abundant opportunity to become infected.

The most common form of tuberculosis in children is hilus tuberculosis also termed latent or "closed" form, and in this I see a great advantage of treatment for when it is in this stage and non-infectious we kill two birds with one stone, viz., save the child and prevent it from later becoming open with tubercle bacilli in the sputum and therefore dangerously communicable. While tuberculosis is decreasing in the adult, it is not doing so in children. On the contrary, at the ages of from 5 to 10 and from 10 to 15 years tuberculosis has increased, and why? Because the modern anti-tuberculosis measures have been devoted more especially to adult life and not to children. The mortality rate has been progressively decreasing during the years of active adult life, the same result has not occurred, or only to a very small extent in children.

Before considering prophylactic measures for the control of tuberculosis in children, I wish to elucidate the term "the pre-tuberculous type of child." I am afraid the average general practitioner will likely confuse these pre-tuberculous types with the simple malnutrition cases, and it is here I want to emphasize the ultimate importance of a distinction between the two.

When we stop to realize from what I have said before that from 40 to 50 per cent of all school children have become infected with the disease as verified by autopsy records, we see how necessary and important it becomes to be able to recognize and treat them before the disease actually develops.

The pre-tuberculous child is one in which the physical state of the child is such that it is only a stepping stone to active or open tuberculosis. It is a state in which the child is either already infected and presenting no symptoms, or where there is a positive case of active tuberculosis in the immediate family irregardless of whether the child is already infected or not. In the children in families in which there is a tuberculosis patient, say a father or a mother, an infection is the more likely to have taken place in this child, and the younger the child, the more likely that infection has already taken place, because the younger, the more intimately do they come in contact with the tuberculosis patient in the family.

If I have a positive clinical history of a known exposure to active tuberculosis, I have good reason to anticipate that I shall obtain other confirmatory evidence. If an exposure to infection is likely to have occurred in the family, the child will most likely appear to be less robust, its appearance more delicate, and in a state of poor nutrition and development. I am guided not only by its weight but take into consideration also the body length as well as the size and massiveness of the bony frame. Next the physical examination of the pretubercular child will generally reveal the following:

1. Markedly underweight.

2. Enlarged glands in the neck, especially the deep posterior cervicals, axilla or groin, after having eliminated other causes.

3. Upper arms rather thin instead of round and full.

4. Chest—the upper third portion slight unequal expansion.

5. Tenderness on pressure over the upper dorsal vetebrae.

6. Breathing — a peculiar inspiratory harsh rasp especially near the area of second left interspace.

7. Enlarged bronchial glands determined by roentgen-ray, which should receive careful consideration.

8. The tuberculin test will confirm any previous finding of suspicious tuberculosis in the child.

Because a child is underweight or undernourished does not mean tuberculosis. Before I accept any apparent deficiency in weight or in the roundess or form as having a tuberculous basis I seek to eliminate other possible factors that may stand in causative relation, these being chiefly disturbances of the digestive functions originating in and more or less perpetuated by unsuitable or improper diet and indulgences, lack of attention to proper evacuations, etc. In addition I eliminate the sequel of proceeding diseases such as measles, scarlet fever, and rickets, which may have left functional disturbances or organic lesions, and farther think of malaria, hookworm and inherited syphilitic taint, all of which may account for deficiencies found. No other reasonable cause being discovered, the nutritive deficiency alone justifies us in suspecting tuberculosis, and if I have an underweight child that is known to have been exposed to infection, the probability is very strong indeed, that this deficiency stands in relation to tuberculosis.

If the chest examination is negative, the fact alone does not in any way eliminate a tuberculous infection and it does so the less, the younger the child is. The infection need as yet not have involved the lungs. A negative finding may also be due to the fact that the lesions are situated deeply or that any tubercles which are present have not yet caused structural alterations sufficiently large to be detected in the lungs. It is true that enlarged glands in the neck and under the jaws are found in infections of the head and scalp, diseased teeth, tonsil or ear diseases and nose infections but they return to a normal state as soon as the cause has disappeared. There are also other glandular diseases we must eliminate but in the absence of these causes we must suspect tuberculosis especially when these glands are situated deeply in the posterior part of the neck.

To prevent and control tuberculosis in children effectively our chief aim should be in the direction of natural immunization. The acquisition of a natural immunity to my mind is about the only real way we can expect to accomplish the end in view, rather than resorting to biological methods, the former being more or less permanent while the latter is only transitory. By natural immunity I mean the forbidding through a legislative act, the intermarriage of the tuberculous. Good seed will yield good fruit and children born of good seed will have a higher natural immunity than those of tuberculous parentage who will have a natural higher susceptibility. This situation to be governed by a law, the same as the syphilitic who is also governed by the same law as oftimes there exists luetic background to a goodly number of tuberculous cases.

As tuberculosis has a national and international distribution, this resistance be gradually extended in the degree in which the non-resistant individuals are eliminated by death and in which more and more only the resistant ones marry and procreate children.

Inbreeding promotes the development of the acquired and transimtted immunity in places where it is forced upon the people by geographical factors, (islands, secluded valleys) since in such cases a greater resistance to tuberculosis is observable than in countries in which "panmixia" prevails. This is especially true in the case of the Jewish people among whom the tuberculous mortality is strikingly lower especially in childhood and the duration of the disease longer and frequently reach old age even if they become tuberculous.

The relative infrequency of tuberculosis in Jewish children, will bear me out in this, the acquired resistance being due to the influence of intermarriage and eugenic principles. The acute and fatal forms of the disease are relatively infrequent, being chronic, lives longer, resisting the disease better than does the tuberculous Gentile.

Next we will have to consider the pre-tuberculous child of school age. Here we should endeavor to find out which children are infected, especially those who live in families where there is a case of tuberculosis.

This can be done by compulsory notification instituting a drastic law requiring all physicians and hospitals to notify the Board of Health in every case, which to be investigated by the health nurse whose duty is to determine any children attending school from this family, that said nurse report the name and name of the school to the school board so that a special check up can be made through the medical inspectors, and the proper measures instituted to safeguard the health of that child.

All children found to have open or active tuberculosis to be removed and treated at once. All the pre-tuberculous cases to receive such care that will upbuild their resistance, by special diet, fresh air and exercise, and placed in open air schools for special hygienic attention. Healthy children in families where there is a case of tuberculosis should either be removed from the family or vice versa. All school teachers to have periodic lung examinations.

All school children should receive instructions in the preventions of tuberculosis.

Those suffering from bone joint or glandular tuberculosis, sent to the sea shore or receive physio-therapeutic treatment.

The above may appear too extensive for any community to undertake, but no labor or expense is too great in the protection of the child from tuberculosis from which it suffers so severely. Whatever we do for children is for the good of future generations and of highest importance to protect the child from tuberculosis, for the child of today is the man of tomorrow and surely has infinite and untold possibilities.

DISCUSSION

Dr. Durel (Covington, La.): It is about time for the medical profession to wake up to the necessity of enforcement measures in the prevention of tuberculosis. I read an article in The Journal of the American Medical Association on "Preventive Medicine as applied to Tuberculous Patients," by Linsly R. Williams, which shows how backwards we are, not only in this community, but throughout the United States. After an extensive survey he finds that 47 per cent of the cases that are seen by doctors and diagnosed as active tuberculosis have not even been told that they have tuberculosis, much less been advised to take any preventive measures. The article, which is in this week's issue of "The Journal" is well worth reading.

I would like to have a law passed, similar to the one in effect in Chicago, that every open case, or case of active tuberculosis be either separated from the smaller children, or the children be separated from the case. We have to come to this if we are to prevent the spread of the disease to the child by the adult. Tuberculosis, as we feel today, is a disease contracted in childhood. Sometimes we find children with tuberculosis of the adult type. We must remember that as long as there is a tuberculous adult in the home that there is a potential factor there.

Here, in New Orleans especially, we are very backwards and it is time for us to awaken to the realization that something must be done for the protection of the children against the spread of this disease. Sooner or later a radical law is going to be passed, so let us get together beforehand and think out something definite and practical. Not so long ago I pleaded with a tuberculous patient not to return home to her children. This woman had six little children to infect. Think of it! Yet I could not stop her—only a law would give me that authority—I could only plead with and advise her, stressing the importance of prevention.

Therefore, let us by all means have a law separating the source of the infection from the non-tuberculous individual.

Dr. E. D. Fenner: I am not going to discuss tuberculosis in children. What I want to say in all earnestness is that the last thing we want is another law about anything—we have too many laws now. I certainly do not advocate separating a sick mother from her offspring; we should leave the mother with he child. Why this excessive paternalism? It is the curse of the country today. The schools are now telling the parents what to do, so I hope that we will not attempt to do anything that will further interfere with the liberty of the people.

CASE REPORTS AND CLINICAL SUGGESTIONS

MILD TYPHUS EXANTHEMATICUS*

(Brill's Disease)

WITH REPORT OF CASE

WILLIAM COLBY RUCKER, M. D.,†

NEW ORLEANS.

The following case of typhus exanthematicus is presented to the Society for the purpose of signalizing the fact that this disease has appeared in the State of Louisiana. So far as I know, this is the first case which has been diagnosed in this State.

Maxcy,[1] writing on the distribution of endemic typhus (Brill's disease) in the United States, prophesied the appearance of the disease in Louisiana in the following words: "Along the Gulf coast, it occurs in Tampa, Pensacola and Mobile. No reports have been received of its occurrence at Gulfport, Miss., or at New Orleans, La., nor indeed from any locality in these two states. Perhaps further investigation will show that the freedom of these two states is apparent rather than real."

Typhus exanthematicus has been called by various names: Spotted, putrid, camp, jail, hospital and ship fever. These are descriptive of the eruption, the odor of the patients and the places in which it has most frequently occurred. The etiology of typhus is as yet undetermined. The *Rickettsia prowazeki,* Plotz's bacillus and other organisms have been brought forward as casual agents but have not received final acceptance. It is known, however, that the disease is infectious and that the infectious agents is a living body which is present in the peripheral blood of persons having the disease. This being the case, it is easy to see how certain suctorial insects, notably the louse, may act as the agents of vection. From the viewpoint of epidemiology, this is extremely important, as are also the facts that the incubation period is, as a rule, from 12 to 14 days and that the disease confers an immunity against subsequent attacks. In those countries in which lousiness is not uncommon, the disease is ordinarily transmitted by the *Pediculus humanus var. corporis,* although Goldberger and Anderson showed that the *Pediculus humanus var. capitus* may also act as a vector. *Phthirius pubis* and *Cimex lectularis* must be regarded as potential carriers, although they have not yet been definitely incriminated. That there exist other and as yet unknown routes for the passage of the infection from the sick to the well, there can be no doubt, since typhus fever has been reported in localities and among people who are louse-free.

The text-book description of a typical case of typhus fever is presented here for comparison with that of the atypical mild type which has been found by Maxcy and other observers in the United States and named mild endemic typhus.

The disease begins abruptly with intense frontal headache and fever (103-105°F), pain in the back and lower extremities, extreme prostration and dusky suffused facies with dull, apathetic expression. The tongue is dry and coated. There is constipation. There may be persistent vomiting; the patient may be actively delirious or very lethargic. The conjunctival mucous membranes are congested. Not earlier than the third day or later than the seventh, there appears on the trunk and extremities a macular erythema sometimes preceded and accompanied by a diffuse blush or dusky subcuticular mottling which looks as though it were seen through a piece of ground glass. Within two or three days, blood extravasates into these lesions, first, as minute petechiae which tend to coalesce and become ecchymotic. The degree of

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*Read before the Orleans Parish Medical Society, March 25, 1929.

†Surgeon, United States Public Health Service, New Orleans.

(1) Public Health Reports, Nov. 23, 1928, pps. 3084-3095.

ecchymosis is a fair prognostic criterion. With this rash, the initial symptoms increase. The patient may pass into stupor or acute mania. This phase resembles the third week of typhoid fever. At the end of the first week, the temperature reaches its maximum. Morning remissions begin which become greater and are followed by evening remissions, the normal being reached at the end of the second week or shortly thereafter.

This is a typical picture. A mild form of the disease was described by Brill in New York in 1910. Following this, Brill's disease was reported in the following order in the years 1910, 1911, 1912 and 1913 from Brooklyn, Chicago, Milwaukee, Washington, D. C., Atlanta, Ga., Boston, Petersburg, Va., Philadelphia, Memphis and Toledo, Ohio. Up to date, endemic typhus has been reported from Alabama, California, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Michigan, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Virginia; in other words, in from 22 states and the District of Columbia. Mild endemic typhus probably represents an infection which has, in some way, been attenuated. Its mortality is practically zero, the duration of the disease is shortened, all of its symptoms are diminished and complications are uncommon. In Mexico, there is an endemic disease called "tabardillo" which, at times, becomes epidemic. This was shown to be identical with typhus by Anderson and Goldberger and several other American workers. It is not at all improbable that the disease was originally introduced into Texas from this focus. It is not beyond probability that cases occurring in northern seaports may be a residuum of the infection which was introduced into the United States by the great flood of immigrants from Ireland in the early part of the nineteenth century but the origin of the disease in the interior of the country and in the Southern States remains unsolved. Another point which remains to be elucidated is the relative infrequency of the disease in negroes.

The diagnosis of typhus fever has been made easier and more accurate by the introduction of the Weil-Felix reaction. This is an empiric laboratory test and consists in the agglutination of the *Bacillus proteus X-19* with the patient's serum. It develops usually in the second week of the disease but has been found as early as the fourth day. When agglutinations occur in dilutions greater than 1:50, they are read as positive. Agglutination with much higher dilutions are found after the temperature becomes normal.

REPORT OF CASE

H. D. S., white male, aged 49 years, employee of the U. S. Marine Hospital, resident of New Orleans 8 years. About two weeks before his illness commenced, he had visited a family in Buras, La.; several members of the family were ill at the time. An investigation there and in this city for any possible contact cases of typhoid or typhus brought no positive results. The patient has never been lousy. There is no evidence of exposure to lice prior to his illness.

About the seventh of January he began to suffer with headache and fever. He treated himself with aspirin and relieved the headache but the temperature continued. He was admitted to the hospital on January 21. He was dull and apathetic and spoke slowly and with a decided slur. For one week his temperature ranged from 101° to 104° and his pulse from 100 to 120. During the next four days both fell to normal by lysis. Physical examination showed a coated tongue, palpable spleen and a dull red, maculo-papular, pin-head to pea-sized eruption over entire body, face, neck and extremeties. He was put on typhoid precautions and treated as a typhoid. His recovery was prompt and complete without complications or sequaelae. Immediately following the return of his temperature to normal, he was much elevated mentally, very garrulous and laughing with little provocation. This soon passed.

Three blood culture were negative for typhoid and para-typhoid. Two Widal tests showed no agglutination for typhoid and para-typhoid A and partial agglutination 1/40 and 1/80 for para-typhoid B. He gave no history of typhoid but had been vaccinated against it 18 months pre-

viously. Differential counts showed leukopenia (4200). No agglutination with B. melitensis abortus or tularemia.

On February 7 his blood agglutinated B. proteus X-19 in a dilution of 1-640. This fact, the negative typhoid and para-typhoid cultures, negative Widals, the character and distribution of the eruption, the onset with persistent headache with no abdominal symptoms and the severe accompanying conjunctivitis, warranted the diagnosis of typhus.

Serum from this patient was sent to the Hygienic Laboratory, Washington, D. C., which reported positive reactions with Bacillus proteus H X_{19} up to 5120 and with Bacillus proteus O X_{19} up to 2560. Saline suspensions showed no clumping. Normal serum against all suspensions showed no clumping above 1:40.

CONCLUSIONS

1. Mild endemic typhus fever has appeared in the State of Louisiana.

2. In cases resembling typhoid and paratyphoid but giving negative Widal reactions and negative cultural tests, typhus fever should always be considered.

3. The Weil-Felix reaction is an accurate diagnostic measure.

THE DECLINE IN THE AVERAGE LENGTH OF LIFE—To paraphrase the words of contemporary humorists, all that I know is what the various statistical data tells me, but, to me, the whole picture, from our earliest records in 1890 to the present time, points consistently and inevitably to a future of a declining average length of life until the American adult wakes up to the fact that the odds are at present heavily against his living as long as his father or grandfather. Some will say—and no doubt truly—that it is all a natural consequence of the great drift to the cities. Others will go farther and say life has become too fast and strenuous and that we do not know as yet how to adjust ourselves to such a life. To the medical authorities the whole problem will loom as one of relieving the strain upon the heart. But little will be accomplished until the American adult himself is duly informed and made to realize that he is in the midst of a decidedly losing fight and that the situation will continue until he applies himself energetically to be superior to his environment. Moreover, each adult must fight his own individual battle, since he usually brooks no interference with his own individual mode of living. Medical authorities and scientists can be depended upon to care for the children and their diseases, but they have little or no chance to interfere with the lives of adults.

It truly looks as if it is going to be a losing fight for some time to come, for, although some adults are making a commendable effort to live sane lives, the vast majority seem very indifferent and many give apparently no thought whatever to habits which they clearly know they could easily discard. There is surely no worse influence than that wielded by well-meaning authorities who go around airing their ill-founded beliefs that all is going well and that before long everybody is going to be living seventy-five to a hundred years!

The presence recurrence of the "flu" promises to obscure the issue, not only by a further abnormal decline but even by the later reaction or recovery which is pretty sure to occur and which is very apt to produce a false impression of security and health improvement.—Forsyth, C. H.: Science, 70:85, 1925.

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NOSTRUMS AND PATENT MEDICINES

A rather cursory glance at the evening papers, as they now are appearing in the City of New Orleans, shows that they contain a considerable number of advertisements of patent and proprietary medicines. A more detailed investigation proves that not only are there many of these advertisements, but also that some of the most blatant and outrageous announcements of secret nostrums are appearing daily, or almost daily. In the pages of these presumed reputable papers are found such advertisements as S. S. S., originally put on the market as a cure of syphilis, but now toned down to a cure of the external manifestations of blood disorders. Wine of Cardui, which at one time was supposed to do anything and everything for the ailing woman, is of course represented. This alcoholic preparation of unknown ingredients is certainly a good pickup and substitute for the old-fashioned pre-Volstead liquor, but as a cure-all for women's complaints is valueless. Ironized Yeast, whatever that may be, is guaranteed to build up the weight in a few weeks or you pay nothing according to the advertisement. Hay fever is relieved with Dr. Platt's Rinex or the money is returned. In conjunction with the frequency with which patent medicines are wont to offer to return the money if the goods are not what they are described to be, one wonders how legitimate manufacturing concerns would succeed if they did not have more faith in their products than do these quacks. Blackdraught, C 2223, 666, Andes, not to forget Carter's little liver pills or the more modern Calotabs offer further advertisement relief to the sufferer, who is willing to put into his stomach drugs of unknown quantity, quality and potency, if any of these preparations are potent, but who would no more think of buying a watch or an automobile without fairly thorough investigation than he would try to fly to the moon.

It is not only the poor and the ignorant who suffer as a result of taking patent medicines of unknown substances for undiagnosed diseases, but it is also the man of presumed intelligence who reads and believes. The most ethical of the newspaper profession appreciate that they have a duty to protect their readers. Sad to relate the high standard of the average professional newspaper man is often nullified by the action of those who are connected with the business side of the paper. It does not seem too much to ask, however, of the business individual that he should be governed by the same high standards that professional men are wont to observe.

DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION.

Attention is called to the communication of Ex-President Herold in another section of the Journal. Dr. Herold discusses the need of a full representation of representatives of the Louisiana State Medical Society to the American Medical Association. It certainly seems remarkable that a great state with an active medical association such as we have here in Louisiana can not get men to represent it at the annual convention of the constitutent state medical societies. If the State of Louisiana wishes to have taxation without representation it can do it merely by selecting delegates and alternates who will not accept their election as a serious obligation to carry out the duties which they were chosen to perform.

The prestige of a delegate at this annual meeting often depends on his knowledge of the details of the administration of the association and of his personal acquaintance with other delegates, many of whom have been re-elected over a considerable period of time and who wield considerable power. The delegates from these other states take their duties seriously; they believe they have a moral obligation to those who elected them; and they function regularly at each and every meeting of the House of Delegates. Therefore, criticism should not be made by us that other states have more influence that do we. The obvious reasons are given. If the medical profession of the State of Louisiana wish to hold a position in the governing body of our national organization, commensurate with their undoubted importance in American medicine, delegates should be elected who will attend the annual meeting of the House of Delegates. That they may familiarize themselves with the workings of the association and become acquainted with other delegates the term of office should be for a period of some years, either by tacit agreement or by constitutional amendment.

Dr. Herold virtually suggests that the elected delegates and alternates should pledge themselves to attend the national meeting. This suggestion should be given due weight by the House of Delegates of the Louisiana State Medical Society when nominations are made for the positions of delegate and alternate to the American Medical Association.

PREVENTION OF DIABETIC DEATHS

Dr. Elliott Joslin, than whom there is no greater authority on diabetes nor a more enthusiastic advocate of preventive medicine, is endeavoring by a systematic effort, in presenting the subject of the treatment of diabetic coma to the medical profession, to forestall this acute, preventable and curable complication of diabetes. In pursuance of this purpose he is broadcasting through the national and state medical journals what should be done to stop deaths from coma, which is responsible for approximately 40 per cent of those who die from the disease.

Joslin says that diabetic coma should be prevented and usually may be cured. Diabetics go into coma because they break their diets and overeat; they neglect infections, whether local as an abscess or general as a respiratory tract infection, because they do not appreciate the importance of examining the urine frequently and regularly at such times; and they stop their insulin because they are not eating.

As soon as the diabetic feels ill or sick he should immediately call his physician,

go to bed, take a hot drink every hour, take an enema, keep warm, get some one to take care of him. These rules should be definitely instilled in his mind by the physician in care of the diabetic.

If coma exists insulin should be given every half hour in 10 to 40 unit doses. If given intravenously it should be also administered subcutaneously at the same time. Normal salt solution, 1000 c.c., should be given by hypodermoclyses as soon as the insulin has been injected, in order to overcome dehydration. The heart should be stimulation with caffein sodio-benzoate, 7½ grains every hour for three or four doses. The stomach should be washed out gently and then ginger ale, the juice of 2 or 3 oranges or weak gruels should be given.

The Journal is thoroughly in sympathy with Dr. Joslin's efforts to prevent diabetic coma. While it is true that these directions have been published before repeatedly, nevertheless the mere fact that there are so many patients dying of diabetic coma would indicate that there are still a considerable number of physicians who are not "insulin-minded", and until the facts of the case are appreciated by such men by repeated and persistent hammering at the treatment of the condition, only then will there be controlled this, the most important complication of a disease which is present in about one in every 150 of our population.

CLIMATE AND HEALTH.

The subject of climatology has been an interesting one to the medical man in the recent years. He knows that not only does civilization rise and fall according to variations in climate, but he knows full well that climate affects the health. The climate in which man works most efficiently is that in which there is a daily temperature averaging 64°F., and with a relative humidity of about 60 per cent. Marked daily fluctuations and yearly changes are conducive to increased energy and greater efficiency. That prolonged spells of hot humid weather not only reduce mental and bodily activity, but also produce retrograde changes in individuals with chronic diseases and lower the general feeling of well being in a normal individual, is well known. Mills describes a syndrome which occurs in patients who have been exposed to a prolonged period of moist heat. These patients complain of low blood pressure, weakness, loss of weight, dizziness, hypermotility of the gastro-enteric tract with either spastic constipation or watery diarrhea and spasm of the various sphincters. Epigastric pains, urticaria and increased pigmentation of the skin are seen at times. In women, menstrual disturbances are frequent, especially dysmenorrhea and menorrhagia.

He assumes that this clinical disturbance is due to a reduction in the functional activity of the adrenal glands. On the basis of this assumption he has given these patients, with rather remarkable results, I mgm. of adrenalin in 30 per cent glucose solution a half hour before each meal. In spite of the fact that adrenalin is not presumed to be absorbed by mouth, Mills maintains that on this therapy the patients improved very remarkably.

This suggestion of Mills concerning the treatment of the individual suffering from certain amount of heat fatigue might be applicable to some of the patients that are seen in Southern Louisiana during the course of the rather prolonged and at times particular humid summers.

HOSPITAL STAFF TRANSACTIONS

VICKSBURG SANITARIUM AND CRAWFORD STREET HOSPITAL STAFF MEETING.

AUGUST 10, 1929.

Abstract—Malunion of Fracture of Greater Tuberosity of the Humerus With Blocking of Joint; Open Operation, Kocher Approach, and Replacement of Fragments.—Dr. H. H. Johnston.

Patient—White, male, age 60, admitted to hospital July 9, 1929.

Complaint—Pain and swelling of right shoulder and inability to use right arm.

History of Present Illness—Four months before admission, fell from a scaffold, a distance of 12 feet, striking upon right shoulder. Severe pain with immediate loss of function. Condition was diagnosed by physician as dislocation of shoulder and under a general anesthetic, reduction was said to have been performed. Following pain was less with function about the same. Two weeks later sent to another physician for roentgen-ray examination and a diagnosis of fracture of the head of the humerus was made. Reduction was attempted and arm held high in an elevated position for six weeks in a plaster cast. Patient states that function did not improve. Since then there has been no appreciable change in condition.

Past History—Fracture of right seventh rib in 1924 in automobile accident. No serious illnesses; no operations.

Family History—Not relevant to present condition.

Physical Examination—Temp. 99°F.; Pulse 86; Resp. 20. Patient well developed and robust; not apparently ill. All teeth have been extracted. Moderate atrophy of right supra-spinatus, infraspinatus, teres minor and deltoid muscles. Considerable swelling about right shoulder joint and head of humerous appears abnormally broad antero-posteriorly. Slight crepitus on moving arm. External rotation impossible but internal rotation apparently not impaired. Abduction limited to 20 degrees.

Other physical examination essentially not remarkable.

Roentgen-ray shows a comminuted fracture of head of humerus involving greater tuberosity, with dislocation.

Urine shows—Sp. Gr. 1.020; slight trace of albumin; rare hyaline and granular casts.

Blood—Hb. 72 per cent; leukocytes 6,400; differential count, small lymphocytes, 39 per cent; large mononuclears, 7; polymorph. neutrophiles, 50; eosinophiles, 4. No malaria found. Wassermann and Kahn tests negative.

Course—Patient suffered continually with pain and open reduction was decided upon two days after admission. Under general anesthesia, posterior exposure of shoulder joint was made by the Kocher osteo-cutaneous flap method. Joint was opened by chiseling loose the greater tuberosity from its abnormal point of fixation. Head of humerous was made smooth by chiseling off irregularities of callus. The greater tuberosity was approximated to its normal position on the arm by abducting and externally rotating the arm. The tuberosity was held in place by drilling shaft and wiring. A large bone screw was also used. Spinous process of scapula was wired in place, wound closed, and plaster cast applied with humerous abducted and externally rotated.

The day following operation temperature was 101°F., and a window was cut in cast and wound examined. It was not draining, however, and showed no evidence of infection. Temperature gradually subsided and was normal at time of discharge, 14 days after admission.

Result—There has been no recurrence of pain since operation. Abduction to about 80 degrees is possible and there is much improvement in external rotation.

Discussion by G. M. Street, J. P. O'Leary, S. W. Johnston, and J. A. K. Birchett, Jr.

Abstract—Addison's Disease.—Dr. J. A. K. Birchett, Jr.

Patient—White, male, age 41, carpenter.

Complaint—For past six months has had general weakness, no energy, tires easily, vague pains in abdomen associated with constipation. Dull pain in gall bladder region and pain in back, worst in region of right kidney. Has noticed that in last three or four months, skin has gradually become dark colored, this being attributed to being much in the sun. Has fever almost constantly but never more than 99.6°F.

Past History—Has had pain in gall bladder region and back for several years. Appendix removed six years ago; complicated by phlebitis. Gall bladder drained in 1926 with no relief from pain and digestive disturbances, which have been present for past six years. Tonsils have been removed. Greatly disturbed by constipation. Feels dyspneic on exertion with rapid heart action.

Genito-Urinary history negative.

Family History—Negative.

Physical Examination—Temp. 99.4°F.; pulse 100; respiration 18; blood pressure 90/70. Large, well-developed and well nourished; skin very dark, copper color. Liver slightly enlarged and tender and marked tenderness over right kidney. Physical examination otherwise negative.

Urine—Large trace of albumin; some hyaline, rare finely granular casts; some leucocytes; some abnormal red blood globules.

Blood—Leukocytes, 9,800; Differential leukocyte count, small lymphocytes, 52 per cent; large mononuclears, 3; polymorph. neutrophiles, 44; polymorph. eosinophiles, 1. No malaria found. Wassermann and Kahn tests negative.

Discussion—Diagnosis of Addison's disease was made because of pigmentation, asthenia, and evidence of disturbance in region of right kidney.

The chief symptoms of Addison's disease are mentioned briefly because they are so clearly brought out in the present case: (1) Pigmentation of skin. There are other diseases which may have characteristic pigmentation of the skin and this sign cannot be of diagnostic importance without other signs also present. (2) Gastro-intestinal symptoms, — constipation and gas. This is probably due to inhibited peristaltic movements through disturbance of the sympathetic system. (3) Asthenia. This was clearly noted in the present patient—muscular weakness, tachycardia, irregular heart action at times. (4) Unusually low blood pressure and pain in the back. Anemia is not a usual sign although Addison stated it as one of the cardinal signs.

Course—Patient has improved on adrenalin, 30 drops by rectum three times a day, and tonics. Blood pressure has at times been as high as 120/80.

Discussed by Drs. A. Street, J. P. O'Leary, and S. W. Johnston.

LOUISIANA STATE MEDICAL SOCIETY NEWS

H. Theodore Simon, M. D., Associate Editor.

FELLOWSHIP IN RADIOLOGY IN THE CHARITY HOSPITAL NEW ORLEANS.

Dr. Amedee Granger, Director of the Roentgen-Ray Department of the Charity Hospital announces that the Board of Administrators of that Institution has established a Fellowship in Radiology.

The Fellows are members of the House Staff, ranking between the Internes and the House Physicians and Surgeons, and at the completion of their year's work will receive a certificate of Fellowship and become eligible for the position of Assistant Radiologist.

Here is a splendid opportunity for graduates of Class A Medical Colleges to obtain thorough training in one of the newest and most important Medical Specialties. The Hospital is one of the largest in this country and the number and variety of clinical material is abundant as shown by the fact that more than 35,000 radiographs are made annually.

BANQUET TO DR. KNOWLTON.

On the night of July 30, the St. Landry Parish Medical Society tendered a banquet to Dr. and Mrs. W. W. Knowlton just before their departure for their Massachusetts home. Until his resignation which took effect some two weeks ago, Dr. Knowlton was the Director of St. Landry Parish Health Unit. It has been a matter of common knowledge, that under his active and wise administration, public health matters have improved to a great extent, and the medical profession of St. Landry sincerely regret the Doctor's departure. We are consoled, however, by the fact that he has been replaced by a sterling young sanitarian who has just arrived from the University of Georgia to take up his duties as Director of the Health Unit.

The banquet given to Dr. and Mrs. Knowlton was attended by about one-half of the Physicians of the Parish, who were happily accompanied by their wives, and all agreed that a most enjoyable evening had been spent.

Dr. L. J. Bienvenue, President of the Society, in a very interesting manner, reviewed its history, and Dr. A. B. Pavy spoke along the lines of public health work, stressing the necessity of close cooperation between the health officials of the State and the various Parishes, and the practicing physicians. Dr. S. B. Wolff, one of the prominent young physicians of this City acted as Toastmaster, and his remarks were well received. Other interesting talks were made by Drs. F. J. Mayer, and George R. Berdin. Dr. Knowlton very graciously and modestly spoke of his work as Director of the Health Unit, and sincerely wished the incoming Director, Dr. Victor Roule, every measure of success in the prosecution of health work in St. Landry Parish.

W. R. LASTRAPES, M. D.,
Sec.-Treas. St. Landry Parish Med. Society.

THE MEETING OF THE AMERICAN MEDICAL ASSOCIATION AT PORTLAND.

At the 80th Annual Session of the American Medical Association in Portland, July 8-12, judging from the abstract of the Proceedings of the House of Delegates, there was no particular outstanding bit of constructive legislation. However, rather important resolutions were proposed and passed, such as the question of medical expert opinion, the standards of physical fitness of automobile operators, the safety of milk for human consumption, the practice of medicine by corporations, the proposed new building and authorization to increase the subscription prize of the Journal to eight dollars. At the conclusion of the meeting the following officers were elected:

President-Elect—William Gerry Morgan, Washington, D. C.

Vice-President—Ernest A. Sommer, Portland, Oregon.

Secretary—Olin West, Chicago.

Treasurer—Austin A. Hayden, Chicago.

Speaker of the House of Delegates—F. C. Warnshuis, Grand Rapids, Michigan.

Vice-Speaker of the House of Delegates—Albert

E. Bulson, Fort Wayne, Indiana.

Member of the Board of Trustees—D. Chester Brown, Danbury, Connecticut, re-elected.

Member of the Board of Trustees—Allen H. Bunce, Atlanta, Georgia, to succeed E. H. Cary, Dallas, Texas.

The President, Dr. M. L. Harris, made the following nominations for standing committees:

Judicial Council—James B. Herrick, Chicago.

Council on Medical Education and Hospitals—M. W. Ireland, Surgeon General, U. S. Army; James S. McLester, Birmingham, Alabama.

Council on Scientific Assembly—Lewis H. McKinnie, Colorado Springs, Colorado.

These nominations by the President were confirmed by the House of Delegates.

HEALTH NEWS OF NEW ORLEANS.

During the week ending August 10, 1929, there were 153 deaths in the City of New Orleans, 82 of whom were among the white population and 71 the colored. Fifteen children under one year of age died during the week, 11 of whom were colored, with a death rate of 18.5. During the corresponding week last year there were 150 deaths in the city with the death rate of 18.3, approximately the same figures as this year.

DR. AMEDEE GRANGER AGAIN HONORED.

Dr. Granger, head of the department of Radiology of the Graduate School of Medicine of the Tulane University of Louisiana, and dirctor of the X-ray department of the Charity Hospital, has received, through the consul-general of Belgium, the citation conferring upon him the distinction of Knight of the Order of the Crown. This distinction is next to the highest conferred by Belgium and is ranked only by the Order of Leopold, outranking the Order of Leopold II.

This honor was bestowed upon Dr. Granger in recognition of his philanthropy in presenting to the Kingdom of Belgium the unrestricted use of his valuable apparatus for the localization of foreign bodies with the X-ray. The apparatus proved of enormous service during the World War.

INTER-STATE POSTGRADUATE MEDICAL MEETING.

The program of the International Assembly of the Inter-State Postgraduate Medical Association has been recently received. The meeting is to be held in Detroit the week of October 21, and a long list of distinguished guests of the association will present clinics. Without enumerating the entire number it is interesting to note that the following men will present some phase of medicine, surgery or specialties:

Dr. Irwin Abell, Dr. Lewellys F. Barker, Dr. Arthur Dean Bevan, Dr. Joseph C. Bloodgood, Dr. Harlow H. Brooks, Sir Bruce Bruce-Porter, Dr. Henry A. Christian, Sir Frank Colyer, Dr. George W. Crile, Dr. Elliott C. Cutler, Dr. John B. Deaver, Dr. Joseph B. De Lee, Dr. Charles A. Elliott, Dr. John F. Erdmann, Dr. John M. T. Finney, Dr. Charles H. Frazier, Sir Henry J. Gauvain, Dr. Elliott P. Joslin, Dr. E. Starr Judd, Dr. Dean Lewis, Dr. Fielding O. Lewis, Dr. McKim Marriott, Dr. Charles H. Mayo, Dr. William J. Mayo, Dr. C. Jeff Miller, Dr. Henry K. Pancoast, Dr. John O. Polak, Dr. William C. Quinby, Dr. Leonard G. Rowntree, Dr. Aldred S. Warthin, Dr. Rollin T. Woodyatt.

At a recent meeting of the International Congress of Surgery held in Warsaw, Poland, Dr. Rudolph Matas was elected one of the Honorary Presidents of the Association.

Telephone cards with instructions for obtaining nurses for the sick have been installed in New Orleans' fire and police departments by the Child Welfare Association of the Community Chest. The Association offers nursing service to working people and their children in accordance with ability to pay. Since 1917 it has enrolled 114 firemen's children and eighty-four policemen's children, and the city's public guardians have been active in advertising the benefits of its work.

Dr. J. L. McElroy, following several months given to visiting medical centers of Europe, has become superintendent of the hospitals of the Medical College of Virginia, Richmond. These are the Memorial, the Dooley, and the St. Philip Hospitals. The Crippled Children's Hospital is affiliated as the orthopedic department for white children.

Dr. Leslie and his wife, Dr. Murray-Leslie, formerly an interne at the Charity Hospital, will leave shortly for El Paso, Texas, where they will settle permanently.

UNITED STATES CIVIL SERVICE EXAMINATIONS.

Physician, $3,800 a Year

Associate Physician, $3,200 a Year

United States Veterans' Bureau

Applications will be rated as received by the U. S. Civil Service Commission at Washington, D. C., until December 30, 1929.

The United States Civil Service Commission announces open competitive examinations for the positions named above. Vacancies in the United States Veterans' Bureau for duty throughout the United States, and in positions requiring similar qualifications, will be filled from these examinations, unless it is found in the interest of the

service to fill any vacancy by reinstatement, transfer, or promotion.

CORRESPONDENCE.

Shreveport, La., August 12, 1929.

To the Editor:

At the recent meeting of the American Medical Association in Portland, I had the honor and pleasure, through the courtesy of the executive officers of our state society, of representing Louisiana in the house of delegates, all of our regularly elected delegates and alternates being absent. I understand that a similar situation prevailed at the Minneapolis session, last year, you being the bearer of the alternate-proxy on that occasion.

I desire to call this matter to the attention of our membership and, especially, those who compose our house of delegates. The matter was brought up before the house at Portland and the Speaker interpreted the rules to mean that only those duly *elected* could sit, and ruled, therefore, that, in the future, no *appointed* proxies will be recognized. At the Baton Rouge session of the L. S. M. S., I decried the practice of some members in accepting positions and then not serving; I realize that, occasionally, circumstances arise which prevent attendance of doctors at far-away meetings; I realize, also, that a busy practitioner cannot get away, *at any time*, with ease—he must always make sacrifices. But, without reflecting upon anyone, personally, I again say what I said at Baton Rouge and add that it shows a lack of interest in organized medicine for our four duly elected delegates and alternates to be unanimously absent from two successive sessions of the American Medical Association.

In view of the above ruling of the Speaker, which was sustained by the House of Delegates, I would suggest that, in the future, in order to have our state represented at the natianal meeting, those delegates and alternates, who are not reasonably sure of attending, resign to our house of delegates, at the meeting of the state society, thereby enabling us to elect men who plan to attend.

Sincerely yours,

ARTHUR A. HEROLD.

July 9, 1929.

New Orleans Medical and Surgical Journal,
1551 Canal St.,
New Orleans, La.

Dear Sirs:

The Executive Council of the American Association for the Study of Goiter has instructed me to inform you that a prize of three hundred dollars ($300.00) and a medal of honor will be awarded by the Association to the author of the best essay based upon original research work on any phase of goiter, presented at their annual meeting at Seattle, Washington, in September, 1930.

Competing manuscripts must be in the hands of the Corresponding Secretary by July 4, 1930, so that the award committee will have sufficient time to thoroughly examine all data before making the award.

Full particulars of other regulations governing details of the offer will be furnished on application.

The American Association for the Study of Goiter hopes this offer will stimulate valuable research work on the many phases of goiter, especially on its basic cause.

Yours very sincerely,

J. R. YOUNG,
Corresponding Secretary.

THE SOUTHERN FARMER'S BURDEN.

DR. P. M. PAYNE,
Director, East Carroll Parish Health Unit.

I.

See yon old chap with bended form,
Weighted down with a triple load,
The cotton bale, the hired man,
The mosquito a pois'nous goad.

II.

A single burden he can stand,
Ask any man who tills the soil;
A double burden wears him out,
Makes him unfit for proper toil.

III.

But further add malaria,
The southern farmer's greatest foe,
This super-burden is enough,
To work him pit'ous, direful woe.

IV.

The shaking chill with fever high,
His blood reduces to a state
Where his resistance cannot stand
The withering strain of such a fate.

V.

"Dumb chills," "swamp fever," "ague-cake,"
Malaria the self-same thing;
In man's blood stream a parasite,
Plac'd there by a mosquito's sting.

VI.

So screen your house, protect yourself,
Against this venom'd insect pest,
You'll sleep at night, next morning rise
Renew'd in strength by peaceful rest.

VII.

Then chill tonics and doctor's bills
No longer must you yearly meet,
But when your crop is harvested
You'll find yourself on both your feet.

VIII.

Your wife, your child, the hired man
Freed from this course you'll soon lift up
Your head and smile as other men,
You'll cast away the bitter cup.

MISSISSIPPI STATE MEDICAL ASSOCIATION NEWS

L. S. Lippincott, M. D., Associate Editor

Dr. Temple Ainsworth, formerly resident surgeon at the South Mississippi Charity Hospital, Laurel, has resigned to locate in Jackson, where he will be associated with Dr. Frank VanAlstine in genito-urinary work.

Dr. William F. Hand, State Line, is now resident surgeon at the South Mississippi Charity Hospital, Laurel.

Dr. Dana V. Clark, representative of the American College of Surgeons, recently inspected the South Mississippi Charity Hospital and was very complimentary in his report. He made only three minor recommendations which concerned the keeping of records.

Improvements and installations of new equipment recently completed at the South Mississippi Charity Hospital include a new brick waiting room for white visitors, a new brick waiting room for colored visitors, new brick sanitary dairy barn, three new Potter fire escapes, two large electric refrigerators, steel filing cabinet for roentgen-ray films, and the plastering and painting of the entire main building.

Dr. F. L. Bott, secretary of the Holmes County Medical Society, reports the following:

The Holmes County Medical Society met at the Court house in Lexington on July 13. Those present and taking part in the discussions were Drs. J. S. Rosamond, West, President; J. J. Kazar, Tchula; R. C. Elmore, Durant, and F. L. Bott, Lexington. Two new members were elected to membership in the Society—Dr. J. F. Howell and Dr. T. P. Haney, both of Lexington.

It is interesting to note that Holmes County has more members than any single-county society in the State, having 15 members and going good. DeSoto County comes next with 13. We have the banner county society of Mississippi. We banquet our members in October and expect a great meeting.

Dr. T. P. Haney read a paper at our last meeting.

Dr. A. M. Doty of Lexington has been in California for his health since April.

Dr. W. K. Stowers, secretary of the Homochitto Valley Medical Society, reports:

The regular quarterly meeting of the Homochitto Valley Medical Society was held in Natchez on July 12. We had a good attendance and enjoyed a very instructive paper on "Glaucoma—Early Diagnosis as a Prevention of Blindness," by Dr. L. S. Gaudet. This paper was illustrated by lantern slides.

Dr. L. S. Gaudet has resumed his practice following an illness of one week's duration.

The following comes from Dr. D. J. Williams, secretary of the Harrison-Stone-Hancock County Medical Society:

The regular meeting of the Harrison-Stone-Hancock County Medical Society was held at the Elks Hall, Wednesday, August 7. The following interesting program was presented:

Tularemia—Dr. D. G. Rafferty, Pass Christian.

Undulant Fever—Dr. H. K. Tippin, Gulfport.

Following the presentation of these papers, there was an interesting discussion by those present. The local laboratories are prepared to make the necessary examinations for the diagnosis of these diseases.

The application of Dr. A. P. Smith of Bay St. Louis for membership in the Society was received and Dr. Smith was regularly elected.

CORRECTIONS.

In the list of chairmen of sections and committees of the Mississippi State Medical Association, published last month, the name of Dr. C. A. McWilliams, chairman of the Section on Eye, Ear, Nose and Throat, was inadvertently mis-spelled, and the names of Drs. I. W. Cooper, of Meridian, and D. W. Jones, of Jackson, were omitted from the Committee on Public Policy and Legislation. This committee consists of Drs. I. W. Cooper, D. W. Jones, and F. J. Underwood, of Jackson.

Dr. W. C. Watts of Drew is reported as suffering with undulant fever in the Baptist Hospital at Memphis. He has been in the hospital for a month.

Drs. L. H. Hightower, Itta Bena, S. D. Newell, Inverness, and R. C. Smith, Drew, attended the practitioners' review course at Vanderbilt University in June, and reported a fine course.

Dr. George T. Warren, of Brookhaven, spent a 30-day vacation trip in Texas and Colorado this summer.

The graduating exercises of the training school for nurses of the King's Daughters' Hospital of Brookhaven were held July 10, seven young ladies receiving diplomas. Mrs. I. L. Parsons, of Jackson, former State president of the King's Daughters, in an inspiring address emphasized the exalted nature and opportunity for service in the profession of nursing. Dr. W. H. Frizell, past-president of the Mississippi State Medical Association, presented the diplomas, and Dr. O. N. Arrington, past-president of the Tri-County Medical Society, presented the badges. Both Dr. Frizell and Dr. Arrington made short addresses to the graduates.

At the regular meeting of the Staff of the Vicksburg Sanitarium, special case reports were presented as follows:

Obstructing Carcinoma of the Descending Colon in a Young Man of Nineteen Years; Resection, Mikulicz Technic.—Dr. A. Street.

Discussed by Drs. G. M. Street, L. S. Lippincott, and J. P. O'Leary.

Addison's Disease—Dr. J. A. K. Birchett, Jr.

Discussed by Drs. A. Street, J. P. O'Leary, and S. W Johnston.

Traumatic Myelitis—Dr. L. J. Clark.

Discussed by Drs. S. W. Johnston, J. P. O'Leary, and G. M. Street.

Malnution of Fracture of the Greater Tuberosity of the Humerous with Blocking of Joint; Open Operation, Kocher Approach, and Replacement of Tuberosity.—Dr. H. H. Johnston.

Discussed by Drs. G. M. Street, J. P. O'Leary, S. W. Johnston, and J. A. K. Birchett, Jr.

Dr. G. M. Street presented a report of the recent meeting of the American Medical Association at Portland, Oregon.

Selected radiographic studies were presented and discussed as follows: Enlarged Thymus, Before and Following Treatment; Pulmonary Tuberculosis; Carcinoma of Descending Colon; Cystic Bone Disease of Lower Jaw; Exostoses of Lower Extremity.

Pathological specimens were exhibited as follows: Adeno-carcinoma of Breast (4 cases) Tuberculosis of Testicle; Adeno-carcinoma of Colon.

Dr. M. J. Few, of Rolling Fork, is specializing in urology at the New York Post Graduate Medical School and Hospital for six months. He expects to complete the course December 31. Dr. Few writes: "I like it here very much and think this a wonderful school."

The regular monthly meeting of the Issaquena-Sharkey-Warren Counties Medical Society was held at the Y. M. C. A., Vicksburg, August 13. The following scientific program was presented:

Undulant Fever—Dr. H. H. Johnston.

Discussed by Drs. F. M. Smith, L. S. Lippincott, and discussion closed by Dr. Johnston.

Conservatism in Surgery—Dr. S. W. Johnston.

Discussed by Dr. A. Street, and discussion closed by Dr. Johnston.

Sinusitis in Children—Dr. E. H. Jones.

Discussed by Dr. A. Street, and discussion closed by Dr. Jones.

The Society is making plans for its annual meeting in December. The meetings of the last two years have been outstanding with guests present from several states and the meeting this year to be no exception. The program committee has announced as essayists Dr. C. C. Bass, of New Orleans, and Dr. James S. McLester, of Birmingham. Dr. H. A. Gamble, of Greenville, will make an official visit as president of the Mississippi State Medical Association and make an address at this meeting. The date has been set as Tuesday, December 10.

Dr. L. L. Minor, secretary of the DeSoto County Medical Society, writes: "We are looking forward with much pleasure to the 1930 meeting of our State Association at Vicksburg. Vicksburg is a fine convention city."

It is much regretted that no word has been received from Dr. I. W. Cooper, of Meridian, during the past month. In his letter of last month Dr. Cooper took such a pessimistic view of the future, that fears are felt for him. However, he may be on a vacation. It is hoped that news of the genial treasurer of the State Medical Association will be received before the next issue of the Journal. It is also regretted that we have no information of the present status of the race between Dr. Joe Green, of Richton, and Dr. L. L. McKinnon, of Hattiesburg, reported by Dr. C. C. Hightower, of Hattiesburg, last month. News of progress of contestants is expected soon.

VITAL STATISTICS.

No marriages or births concerning the physicians of Mississippi have been reported.

SOME HIGH LIGHTS IN MISSISSIPPI MEDICAL HISTORY.*

(Continued)

The second meeting of the Mississippi State Medical Association was held in Jackson, April 20, 1869. Dr. A. B. Cabiniss was called to the chair and Dr. Ed. Lea, of Winona, was appointed secretary. Reorganization was effected by the election of Dr. E. T. Henry, of Vicksburg, president; Drs. Thomas D. Isom, of Oxford, E. G. Banks, of Clinton, S. V. D. Hill, of Macon, and William Compton, of Holly Springs, vice-presidents; Dr. Ed. Lea, recording secretary; Dr. M. S. Craft, corresponding secretary, and Dr. P. T. Bailey, of Jackson, treasurer.

Much important business was transacted at this meeting, which was really the beginning of the State Association. The constitution and by-laws of the former meeting were re-adopted with slight change.

The following were elected delegates to the American Medical Association, to meet in New Orleans: Drs. F. W. Dancy, S. B. Cutler, W. Y. Gadberry, M. S. Craft, Robert Kells, James R. Barnett, K. C. Devine, P. F. Whitehead, Ed. Lea, E. T. Henry, H. C. McLaurin, W. B. Williamson, C. B. Galloway, S. V. D. Hill, —— Martin, T. D. Isom, F. Hughes, B. F. Ward, A. Thomas, J. S. Davis, L. Lipscomb, J. P. Moore, Gus Evans, J. G. Thornton, A. G. Mayers, J. M. Greene, A. S. Snell, A. H. Smith, Wirt Johnston, D. A. Kinchloe, —— Lyle, —— Harper, and J. J. McLean.

"On motion of Dr. Barnett, a committee was appointed to prepare an address to the medical profession of the State, urging the importance of speedy organization of county or local societies; and, on motion of Dr. Hill, a committee was appointed to prepare an address to the people of the State respecting the importance of a more perfect system of drainage upon plantations, with a view to as far as possible arresting the production of miasma, so fruitful as a source of grave forms of fever.

"Chairmen of committees were appointed, also, to report at the next meeting on important medical subjects. The Association adjourned to meet at Vicksburg on the first Monday in April, 1870."

*Facts gathered from a History of the Mississippi State Medical Association, published in 1910.

PROBLEMS OF MECHANICAL REFRIGERATION.—Several deaths which have occurred recently in Chicago have been attributed to poisoning by methyl chloride which leaked from refrigerating systems. These have received wide publicity, and have caused apprehension, even among the users of refrigerating equipment entirely unlike that to which the fatalities have been attributed. It is the purpose of this statement, authorized jointly by the Public Health Service, the Bureau of Standards, and the Bureau of Mines, to state the essential facts regarding this danger and to relieve any undue anxiety in the minds of those possessing household refrigerating systems.

All refrigerating systems in practical use depend for their operation upon the repeated gasification and condensation (sometimes by dissolving or "absorbing" in another substance) of a material which is technically called a "refrigerant". In most cases the refrigerant is confined under pressure in the refrigerating machine, and if it escapes from the system, becomes a gas which mixes with the surrounding air.

For many years the gas ammonia was almost the only refrigerant used. For technical reasons, other refrigerants have more recently been introduced and are now extensively employed. Sulphur dioxide and methyl chloride are the most important of these.

None of the three refrigerants mentioned, ammonia, sulphur dioxide or methyl chloride, can be breathed with impunity, but none are violent poisons when breathed for a short time in low concentrations. If the same amount of the three substances is considered, methyl chloride is the least poisonous of the three; but because their physiological effects are quite different it is hard to make a quantitative comparison. Sulphur dioxide and ammonia both have strong odors which are easily recognized and are so irritating that no one is likely to breathe much of them if escape is possible. Methyl chloride has a slight and rather pleasant odor, which probably would not awaken a sleeping person and might not be recognized by one who was awake. To this fact is to be attributed any greater hazard from methyl chloride than from other commonly used refrigerants.

Most of the trouble attributed to methyl chloride has occurred in connection with multiple refrigerating systems installed in apartment houses in which a single compressor delivers the refrigerant through tubes to the refrigerators in the several apartments. A large majority of the individual household refrigerators of the motor driven ("electric") type now in use employ sulphur dioxide as the refrigerant. Nearly all, if not all, of the domestic refrigerators, the operation of which depends upon supply heat instead of mechanical compression, use ammonia.—*Health News of the U. S. Public Health Service.*

BOOK REVIEWS

Protozoology: A Manual for Medical Men: By John Gordon Thompson, M. A., M. B., Ch.B. and Andrew Robertson, M. B., Ch.B. New York. Wm. Wood and Co., 1929. pp. 376.

This beautifully printed and handsomely bound volume is a laboratory text in clinical protozoology. It is a written presentation of the high type of work in this important section of medical zoology which the authors give in their course in the London School of Hygiene and Tropical Medicine. All important aspects of human protozoology are considered in this manual and, in addition, the human spirochetes are also discussed. The work is well balanced, the textual illustrations are excellent and for the most part original. There are also four beautifully colored and scientifically accurate color plates, which add much to the attractiveness and value of the volume. The authors apologize for the scanty bibliography, actually less than three pages. Some of these are only of historical value. If twenty pages of references, covering the citations in the body of the manual, had been included the work would have had much greater value. In some instances, not many, proof has not been carefully read, as, for example, on pp. 225-226 one investigator's name has been spelled in three different ways. On the whole, however, these criticisms are offset by the outstanding merit of the work itself, and the reviewer could heartily recommend it to students were it not for the exorbitant change of $11.00, or approximately three cents per page, which is twice as much as the student ought to have to pay for this sized manual.

ERNEST CARROLL FAUST, Ph.D.

A Surgical Diagnosis: By J. Levi Donhauser, A. B., M. D., F. A. C. S. New York. D. Appleton & Co., 1929. pp. 799.

As this book is essentially for medical students and hospital residents and as history taking is of such importance and value in the arrival at surgical conclusions, a considerable amount of space has been devoted to the proper methods of procedure, namely, the taking of a good history, a thorough examination of the patient, the proper use of laboratory methods and instruments of precision and, finally, a correct interpretation of the case from the facts ascertained. The student is also made to realize that laboratory methods and instruments of precision are only adjuncts and not always essential in arriving at a surgical diagnosis. This is timely and well taken for if we are to believe some of our contemporaries, no diagnosis can be made until the patient has been put through the gamut of laboratory tests.

The importance of visualizing the signs and symptoms along anatomical, physiological and pathological lines and not merely as so many ultimate facts is stressed throughout.

The illustrations found in the chapter on Fractures and Dislocations are adequate, accurate, being based upon radiograms, and essential to show the methods of displacement by muscle pull and by deformity.

This book should be of value not only to the student, interne or general practitioner, but also to those teaching the art and science of surgical diagnosis.

PAUL G. LACROIX, M. D.

Getting Ready to be a Mother: By Caroline Corrant Van Blarcom, R. N. Zd. Ed. Rev. New York. The Macmillan Co., 1929. pp. 286.

This little work is one of the best of the many manuals for expectant mothers that are available. It is interesting, readable, and practical. It covers the essential points with which every woman expecting a baby should be familiar, and contains very little that be omitted, in contrast to many other books of this type. The various topics that the physician should discuss with prospective mothers are taken and are presented more fully than the doctor as a rule is able to do in office consultations. It can be heartily reccommended as a valuable book to place in the hands of our obstetrical patients.

E. L. KING, M. D.

Manual of Helminthology, Medical and Veterinary: By H. A. Baylis, M. A., D.Sc. New York. Wm. Wood and Co., 1929. pp. 303.

Although this handsomely bound volume is intended to be a companion to Thompson and Robertson's Protozoology, the Helminthology is actually confined to the systematic presentation of the helminths of man and domestic animals without reference to their clinical importance. The material relating to the species of helminths in man can be found to better advantage in recently published works dealing strictly with human forms and presenting information of value to the clinician as well as to the student of zoology. The work of an eminent helminthologist, it is unfortunate that this volume is so limited in its outlook, although it will probably appeal to the advanced student of zoology who desires to gain an accurate idea of the taxonomic relations of helminths of man and domestic animals.

ERNEST CARROLL FAUST, Ph.D.

A Manual of External Parasites: By Henry Ellsworth Ewing. Springfield, Ill., Chas. C. Thomas. 1929. pp. 225.

This little volume is a timely presentation of the more important arthopods, exclusive of flies and their allies, which parasitize man and the higher vertebrates. Briefly summarize it takes up *ad seriatim* mites, ticks, biting lice, sucking lice, and fleas, while the final chapter is devoted to a "Description of New Genera of Ectoparasites." The several groups are considered from the aspects of structure, life history, classification, and prophylaxis. For each group there is a brief but comprehensive reference citation. Ninety-six well chosen figures illustrate the volume. Without attempting to cover the field of medical entomology the author has furnished a useful and authoritative study which should appeal to a large group of investigators.

ERNEST CARROLL FAUST, Ph.D.

Methods and Uses of Hypnosis and Self-Hypnosis: By Bernard Hollander, M. D., M. R. C. S., L. R. C. P. New York, The Macmillan Co. 1928. pp. 191.

This book affords many very useful suggestions for the psycho-therapist, not only from the standpoint of hypnotic analysis, but offers many practical suggestions for every day use.

It is easy to see that Hollander is an enthusiast on his subject, but there is a leaven of hard common sense and practicality pervading the whole book, which renders it very interesting to read. It is possible that the manner in which the author handles the subject of hypnosis would lead the uninitiated into the error of thinking the technic more easily mastered than it actually is, but, nevertheless, the book should prove a very useful, as well as practical, addition to the specialist's library.

E. McC. CONNELY, M. D.

Diseases of the Gall-Bladder and Bile Ducts: By Evarts Ambrose Graham, A. B., M. D., Warren Henry Cole, B. S., M. D., Glover H. Copher, A. B., M. D., and Sherwood Moore, M. D. Philadelphia, Lea & Febiger. 1928. pp. 477.

This new book on the biliary tract, written by the author of the ingenious method of cholecystography, represents a timely compilation and discussion of the various modern clinical and laboratory procedures used in examination of the gall tract. In a way to be expected, much space is allotted to the details of gall-bladder visualization. There is a broad and fair interpretation of the clinical values to be derived from the utilization of this method. The experiences of numerous other observers of gall-bladder physiology and pathology are given much space and due credit. The illustrations of gall-bladder shadows, especially some of the rarer, abnormal types found in large series of studies, are instructive and should be helpful for comparative reference.

There is an outline of the methods used in determination of liver function. Several dye methods, bromsulphalein, phenotetrachlorphthalein and phenoltetraiodophthalein, and those of lesser importance are very plainly described. In addition the bile pigment and carbohydrate tests are mentioned.

Surgery of the gall-bladder and bile ducts, including the accepted methods of handling same, occupy several chapters. Little consideration is given to the medical measures for relief of many conditions known to be aided thereby, or even to some means of helping that large army of post-surgical individuals (cholecystectomized or otherwise) that resorts to the internist for some or more relief.

DANIEL N. SILVERMAN, M. D.

The Duodenum, Medical, Radiologic and Surgical Studies: By Pierre Duval, Jean Charles Roux and Henri Beclere. Tr. by E. P. Quain, M. D. St. Louis, C. V. Mosby Co. 1928. pp. 212.

This short volume of 200 pages on the duodenum, written by a French surgeon, internist and radiologist, affords the student of the digestive tract an opportunity to glean many important facts about a much neglected organ from the standpoint of the different investigations.

The six chapters comprise instructive discussions of the symptoms, and illustrations of the changes undergone by the duodenum as a result of extensive disease (especially gallstones), and of intrinsic pathology such as periduodenitis, compression of the third portion by the mesenteric pedicle, duodeno-jejunostomy and ulcer of the bulb.

The sixth chapter is of particular moment since it clearly demonstrates the reason for considering duodenal intoxication as the important phase of intestinal toxemia rather than that of colonic putrefaction. In fact, the degree of intestinal toxemia seems to be in indirect proportion to the putrefactive processes.

The text is recommended more to the specialist on digestive diseases, since it deals with only a small part of the digestive tract.

DANIEL N. SILVERMAN, M. D.

Text-Book of Surgery: W. Wayne Babcock, A. M., M. D., F. A. C. S. Philadelphia, W. B. Saunders Company. 1928. pp. 1367.

The book is an excellent text-book for students and a dependable reference work for the busy surgeon. The author says, in his preface, "I have written in a dogmatic vein what practice and study have made me believe is true today."

In reviewing the work one realizes that the practice of the author presents in the main that which is conceded to be the best standardized practices.

It is surprising how well the author has succeeded in bringing into this volume a great many of the more recently developed tests which make for accuracy in surgical diagnosis. This is particularly true in chapter 35, "Spine and Cord."

It would be beyond the scope of this review to mention in a critical way each chapter, or even to mention the best points in each chapter.

There are certain chapters, however, which merit special attention. The chapter on pre- and post-operative treatment is excellent and may be followed.

The details on surgical anatomy, in the chapter on ligations, are concisely given.

In the chapter on plastic surgery the illustrations are so excellent that one hardly need read the text.

It is such a work as one might recommend without hesitation to students.

ISIDORE COHN, M. D.

Clinical Electrocardiograms: By Frederick A. Williams, B. S., M. D., M. S. Philadelphia, W. B. Saunders Company. 1929. pp. 219.

The purpose of this monograph, as indicated in the preface, is to serve as a reference work in the interpretation of clinical electrocardiograms for those whose experience in the field is limited. The text is brief, no attempt being made to discuss the galvanometer or the theoretical aspects of electrocardiography or the cardiac mechanism. The significance of the deflections is summarily presented, together with short discussions of the various irregularities and of the wave changes which experience has shown to be associated with myocardial disease.

The text is illustrated by 368 figures, each accompanied by an explanatory legend which includes a statement of the pertinent clinical diagnosis. For the latter reason the figures cannot fail to be of value to the student. The author also includes interesting mortality tables, based upon his own observations and those of his coworkers.

It is too much to expect that any volume shall be free from error. But in this work the author repeatedly betrays a lack of appreciation of even the fundamentals of electrocardiographic interpretation, particularly as these apply to the mechanisms involved.

In the legend accompanying figure 74 and in the text on page 56, and again on 127, the author speaks of auricular flutter associated with sino-auricular block. While it is true that a heart at times subject to paroxysms of flutter may show sino-auricular block at other times, yet anyone who understands the mechanism of flutter will recognize the inadmissibility of assuming that sino-auricular block may interrupt flutter. Another example, of more importance from the clinical side, is to be found in figures 138 and 139. The first of these figures is interpreted as complete auriculo-ventricular block; the second as 2 : 1 partial heart block. In reality the same mechanism is present in both cases—namely, slow A-V conduction, the P-R intervals being approximately 0.27 sec. The P waves are exceptionally high in these electrocardiograms. Figures 60 and 61 indicate that the author either does not know or does not apply the criteria upon which an interpretation of retrograde conduction must be based. Perhaps the most significant error, however, is designating as interpolated, the premature beats of figure 41. This is repeated in the text on page 42. Finally, neither figure 187 nor 188, chosen to portray sino-auricular block, is illustrative of that condition. They are examples of sinus arrhythmia. Here again the author is either ignorant of or fails to apply the necessary criteria. The interpretations of a number of other figures are also either incorrect or highly debatable. Nor is the text free from similar blunders.

The reviewer wishes to make it clear that some of these errors are unimportant from the purely clinical standpoint. They must be emphasized, however, since they determine the general caliber of the first half of the monograph.

Perhaps the second half of the mongraph is better. Yet certain of the author's interpretations, *e. g.*, the distinction between complete and incomplete bundle branch block, appear to be at variance with authoritative opinion.

The book is not, therefore a trustworthy guide either for those who desire to further their knowledge of electrocardiography from textual explanations or for those who wish to improve their ability to interpret tracing by comparing their own interpretation with those of the author.

RICHARD ASHMAN, Ph. D.

The Heart: By Thomas Walmsley. (Vol. IV, Part III of Quain's Anatomy, eleventh edition.) London, Longmans, Green & Co. 1929. pp. vii + 152. 84 illus.

The high standard set by preceding issues of Quain's Anatomy and other volumes of the current eleventh edition is maintained in the present revision of the section on the heart, published in a separate volume.

The content of the book is indicated by the following major headings: Comparative anatomy; Embryology; External form; Interior; Form of the systolic heart; Minute structure and histology; Blood vessels; Lymph vessels; Nerves; Position; Dimensions; Abnormalities; Pericardium. The work departs from the conventional, purely descriptive type of anatomical text. Not only is the heart treated from the descriptive standpoint, but its structures are presented in correlation with the functioning of the organ. The "connecting system" claims a large share of the thirty pages devoted to minutes structure and histology. Embryology and comparative anatomy are drawn upon extensively for their explanatory bearing upon the anatomy of the human heart. Much recent work is incorporated, and a bibliography of nearly three hundred titles adds to the usefulness of the volume for those who desire an anatomical reference on the subject.

HAROLD CUMMINS, Ph. D.

Recent Advances in Psychiatry: By Henry Devine, O. B. E., M. D., B. S. (Lond.), M. D. (Bristol), F. R. C. P. (Lond.). Philadelphia, P. Blakiston's Sons & Co. 1929. pp. 340.

To the reviewer's desk comes this volume of recent advanced series dealing with psychiatry, segmental in formation and can readily be used as a companion to the advanced series in Neurology of Brain and Strauss by the same publishers.

It is the work of an academician as well as a psychiatrist inasmuch as there is much biogenic as well as psychogenic analysis of the elements and fundamentals necessary in writing a book of this type.

It is of interest to note the paragraphs given to the explanations of acute infections and toxemias and causative factors in the psychoses. Likewise the chapter on Biogenic Psychosis. In this chapter the spiritus familiaris is elaborated upon much more than in other volumes pertaining to the same subject. Intertyped here and there one reads excerpts and explanations flavored with psycho-analytic interpretations which adds interest to the descriptive delinations of the various types within its covers.

It is well written, easily readable, containing much instructive material with especial reference to the treatment of the various psychoses.

Following each chapter is appended references which readers may use as an aid for more detailed explanations. The book should be read by every Neuro-Psychiatrist and is a valuable addition to any medical library.

WALTER J. OTIS, M. D.

Chronic (Non-Tuberculous) Arthritis: By A. G. Timbrell Fisher, M. C., F. R. C. S. (Eng.). New York, The Macmillan Co. 1929. pp. 232.

This text-book is the result of a careful review of most of the important literature covering the subject of arthritis, together with the personal experience of the author. It represents, therefore, a digest of the subject of chronic arthritis, giving modern interpretation of the pathology, symptomatology and treatment of the disease. The text is well written and the expressions of opinions carefully selected. The illustrations are accurate and enlightening.

It would be impossible to abstract such an important volume. Only study of the text itself could possibly do justice to the work of the author. It is recommended as being an unusually valuable text for medical students, as well as those already practicing medicine. It is interesting to read, but still is not a long drawn out dissertation which would detract from the interest of the subject.

JOHN T. O'FERRALL, M. D.

Surgical Pathology: By William Boyd, M. D., M. R. C. P. Ed. Dipl. Psych., F. R. S. Can. 2nd ed. Philadelphia, W. B. Saunders Co., 1929. pp. 933.

As a text for his book the author gives the following quotation from Osler, "As is our pathology, so is our practice." The first chapter begins with the following paragraph, "The surgery of today is based on pathology. Unless he builds on that solid formation, the surgeon is no better than a hewer of flesh, and a drawer of blood." With these thoughts paramount, the author proceeds with this excellent treatise on surgical pathology. Always maintaining the viewpoint of the pathologist, he displays an intimate knowledge of surgery, which enables him to treat his subject in a most practical and convincing manner. Boyd presents pathology as a science, of which an accurate knowledge is as essential to the surgeon as his skill in handling his instruments.

Boyd's Surgical Pathology describes the usual pathological conditions, in simple concise language, which makes very interesting easy reading.

The author describes his cases and gives his experiences in an almost conversational manner. The experiences and opinions of many other prominent men are cited. A list of references is found at the end of each chapter. The illustrations are numerous and exceptionally good. A better surgical pathology for general use by the surgeon, pathologist, or medical student would be hard to find.

ADELAIDE MARY ZOELLER, M. D.

The Vertebrae: By Arial Wellington George, M. D., S. C. D., F. A. C. R. and Ralph Davis Leonard, A. B., M. D., New York, Paul B. Hoeber, Inc. 1929. pp. 256.

This volume of the Annals of Roentgenology should prove of great value to all roentgenologists and particularly to those interested in the Workmen Compensation Act, affording a better understanding of some of the more common conditions of the vertebral column found in industrial accident cases.

This book comprises a complete roentgen study of the whole vertebral column, including anomalies, fractures, dislocations and bony pathology. It contains 249 pages, including 212 well selected illustrations adding to the value of the book.

A whole chapter is alloted to Medico-Legal Expert Testimony with many valuable suggestions to those who are called to court as expert witness in injuries of the vertebral column.

LEON J. MENVILLE, M. D.

Disease of the Thyroid Gland: By Arthur E. Hertzler, M. D., St. Louis. C. V. Mosby Company, 1929. pp. 286.

The second edition of this splendid monograph on diseases of the thyroid gland deserves more than passing mention. It is the work of a student of medicine who has been particularly interested in the pathology and the operative treatment of goiter. Hertzler maintains that all types of disturbances of the thyroid gland are one and the same, and do not represent separate diseases but stages for the most part of one progressive disease. That is to say, a young woman with a simple colloid goiter might possibly develop a non-toxic adenoma which later becomes toxic and finally developes into a typical exopthalmic goitre disease. The literary style of the author is much to be commended. The book reads easily and is not too technical. In fact, one is rather struck with the conversational type of presenting the subject, and to a certain degree at least it adds a great deal of pleasure to the reading of a subject which might be exprssed in such technical and difficult terms that it would be read with difficulty. A chapter on the hospital management of goiter patients by Chesky adds to the value of the work for the surgeon.

J. H. MUSSER, M. D.

PUBLICATIONS RECEIVED.

Oxford University Press: New York and London: Oesophagel Obstruction, by A. Lawrence Abel, M. S. (Lond.) F. R. C. S. (Eng.) Birthday Volume, by Robert Jones, M. D. Gastro-Intestinal Diseases, The James MacKenzie Institute for Clinical Research, St. Andrews. Tweedy's Practical Obstetrics, edited and largely re-written by Bethel Solomons, M. D., F. R. C. P. I., M. R. I. A. Tuberculosis, its Prevention and Home Treatment, by H. Hyslop Thomson, M. D., D. P. H. The Principles of Electrotherapy and Their Practical Application, by W. J. Turrell, M. A., D. M., B. Ch. (Oxon.), D. M. R. and E. (Cantab.). The Treatment of Fractures and Dislocations in General Practice, by C. Max Page, D. S. O., M. S. (Lond.), F. R. C. S. The Cytoarchitectonics of the Human Cerebral Cortex, by Constantin von Economo. Artificial Sunlight and its Therapeutic Uses, by Francis Howard Humphris, M. D. (Brux.), F. R. C. P. (Edin.). Ker's Infectious Diseases, revised by Claude Rundle, O. B. E., M. D. (Lond.). Some Principles of Minor Surgery, by Zachary Cope, M. S., M. D. (Lond.). F. R. C. S. (Eng.). Endocrine Disorders, by Professor Hans Curschmann. Haemorrhoids, by Arthur S. Morley, F. R. C. S. (Eng.). Diagnosis and Treatment of Deformities in Infancy and Early Childhood, by M. F. Forrester-Brown, M. S., M. D. (Lond.). Diseases of the Larynx, by Harold Barwell, M. B., (Lond.), F. R. C. S. (Eng.).

W. B. Saunders Company, Philadelphia and London: The American Illustrated Medical Dictionary, by W. A. Newman Dorland, A. M., M. D., F. A. C. S. Physical Examination and Diagnostic Anatomy, by Charles B. Slade, M. D.

Charles C. Thomas, Springfield, Ill. and Baltimore: What Everyone Ought to Know, by Oliver T. Osborne, M. D. Selected Readings in Pathology, from Hippocrates to Virchow, edited by Esmond R. Long.

William Wood and Company, New York: Orthopedic Surgery, by Sir Robert Jones, Bart. K. B. E., C. B. and Robert W. Lovett, M. D., F. A. C. S.

Wilhelm Maudrich, Vienna: The Treatment of Fractures, by Lorenz Bohler, M. D.

P. J. Kenedy & Sons, New York: The History of Nursing, by James J. Walsh, M. D., Ph.D.

United Fruit Company, Medical Department, Seventeenth Annual Report.

Reprints.

Clinical Spirograms and Their Significance, by Max Trumper, Ph.D.